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# GEORGE ADLINGTON SYME ORATION: THE PROGRESS OF SURGERY, WITH ESPECIAL REFERENCE TO INTRACRANIAL SURGERY.[1]

By SIR HUGH CAIRNS,

*Sims Commonwealth Professor; Nuffield Professor of Surgery, Oxford.*

FIRST may I thank you for the great honour which you have done me by choosing me to deliver this oration in memory of your first president, George Adlington Syme. The oration seems to me one in which it would be appropriate to review the progress of surgery, for is it not the expressed aim of this College, now come of age, "to promote the art and science of surgery"? The subject is one which was clearly of perennial interest to Syme and, if I may judge from his writings, one in which his wisdom, forthrightness and powers of generalization would have been welcome at the present time. For, during the past eighty years, indeed even during the lifetime of this College, great changes have taken place in medicine and the related sciences; and, largely as a result of the second world war, the rate of application of scientific discoveries and methods to clinical problems has become more prompt. The rapid growth of knowledge in all sciences has been obtained largely by increasing specialization, and that has brought with it great problems, not only of education but also of liaison, for most branches of scientific knowledge are mutually interdependent. Today no young student of medicine can be regarded as adequately equipped for the future unless he has a broad grasp of the basic sciences. How often one meets a surgeon, a physician or even a physiologist who regrets that he does not know more chemistry. In this welter of progress where does surgery stand? How may we best continue to promote the art and science of surgery?

I must say at once that I have no dogmatic answers to these questions. All that I can do is to try to draw a picture of progress in one small section of surgery with which I have been closely concerned during the last twenty years. To make this picture concrete to the distinguished lay guests I shall tell the story of one of my patients who was successfully treated by removal of a brain tumour some seventeen years ago. Though at the time it was for me an important exercise of the surgical art, there is nothing special about this case; but if we try to trace the growth of knowledge which led to its successful outcome we shall cover more ground than might at first be expected; and the case is old enough, and its sequel is sufficiently well known, to provide an experience of permanent value. Time can play strange tricks with methods of therapy.

[1] Delivered at the twenty-first annual meeting of the Royal Australasian College of Surgeons, January 27, 1948. Accepted for publication, February 9, 1948.

## THE CASE (No. 343).

The patient was a woman, thirty-nine years of age when I first saw her at the London Hospital in November, 1930. She had lived most of her life in the East End of London, had married at the age of thirty, and had had three healthy children. Apart from varicose veins she had been fairly healthy and had been energetic until three years before she came under my care; but when her story was gone into it was found that she had suffered headaches for twenty-one years and it may be that a tumour had slowly been growing within her cranium all that time, though the headaches were attributed to the fact that she had bumped her head rather badly during one of the air raids on London during the first world war. This gave her a black eye at the time, but no other ill effects, and it is typical of her that she kept at her work.

Three years before I saw her she became nervous and irritable with her children and her husband, waking up early in the mornings and worrying about what she had to do, what to get for dinner and whether her little daughter would be all right crossing the road on her way to school; and getting very upset and even tearful when she could not get through her work up to time.

It is as well that I should explain to the lay members of the audience that these symptoms, which I am sure a good many of us suffer from time to time, are not due to brain tumour, but constitute the reaction of this type of patient, the very conscientious, perhaps over-anxious type, to difficulties of life engendered by any cause, but in this instance by the tumour. Another type of patient with an identical tumour might exhibit an entirely different disorder of mood and personality—the psychological reaction largely depends on the type of the individual rather than on the nature of the disease.

To return to our patient. From this time onwards she could not do her housework properly and she began to develop paralysis of the left side—first of the left hand, together with attacks of cramp in the hand, and then of the left foot—and she began to have difficulty in controlling her bladder. At times also her sight would be blacked out for a few minutes. She lost the power of reckoning up the change of a £1 note (they kept a little shop). Also when out of doors she would have a peculiar feeling that she was lost and all alone in the world.

Examination showed that she was very drowsy and lethargic, slow in answering questions, careless of her personal appearance, and lacking in understanding of her plight. By this time the worries of the earlier days of her illness had given way to an abnormal feeling of well-being and she was quite free from the anxiety that one might expect in a person who had such a serious malady. This is a common symptom of disturbed brain function. Her eyesight was reduced to one-third of normal, and she had difficulty in reading the newspaper. Examination of the fundus of her eyes with an ophthalmoscope showed swelling of the optic discs (six dioptres in both eyes) and it was clear that she would go blind if her condition was not soon relieved. Her left arm and leg were extremely weak, almost completely paralysed, and the sensibility of her left hand was dulled. While under observation she developed retention of urine.

The steps in diagnosis were as follows. The weakness and impairment of power and feeling in the left arm and leg indicated trouble in the right side of the brain. The story of severe headaches, taken in conjunction with the swelling of the optic nerve heads, indicated a rise of pressure inside the head, almost certainly due to a tumour; and the steadily progressive character of the illness also strongly favoured this diagnosis. X-ray examination of the skull not only confirmed this opinion, but also indicated the precise situation and nature of the tumour; it showed changes in the bone over the suspected part of the brain, changes of a type which had been shown a few years before to be characteristic of meningioma—a benign but very vascular type of brain tumour. The case was clearly one for operation and one in which much loss of blood might be expected. Suitable preparations were therefore made; her husband's blood was tested and found to be compatible with hers, and arrangements were made for him to be at hand during the operation to give a blood transfusion if required.

*Operation.*—On November 10, 1930, the tumour was removed under local anæsthesia by the usual methods. When the osteoplastic flap was raised there was such a torrent of bleeding from the surface of the tumour that, though it was partially controlled by

pressure, the patient's blood pressure rapidly fell to 60 millimetres of mercury, she became pulseless at the wrist and complained of great thirst. The only relieving features of the situation were that her voice remaind strong and her pulse could still be felt at the femoral artery. The patient's head was lowered and operative manipulations were suspended until the husband's blood was obtained and introduced into her veins. By this time her blood pressure had recovered spontaneously and during the remainder of the six-hour operation her general condition gave no anxiety. The tumour, which weighed 200 grammes, was then removed uneventfully, after its bulk had been reduced by gutting its interior. This was effected with a high-frequency current or endothermy, a useful technical method recently introduced by Cushing in 1927, and the numerous vascular attachments of the tumour were also sealed by endothermy. During the operation we learned a considerable amount about the technique of reducing blood loss in these operations.

*Post-Operative Course.*—On the day after operation the patient's left hand and leg were a little stronger. On the following day she had hallucinations of movement of the left hand, a phenomenon which we have since encountered in a few other cases of recovering hemiplegia after removal of a tumour. Recovery of the disturbed functions pursued an even course. On the thirteenth day after operation she found her sight was better. On the twenty-second day she walked and found that she did not now drag her left leg and that she could now wash herself with her left hand. There were no more cramps in her left hand. She felt less irritable and felt differently towards her children when they came to visit her.

She went to a convalescent home, where she gained seven pounds, and ten weeks after operation she started housework again, except the heavy work.

In May, 1931, six months after operation, she reported that she was doing all her housework and all her shopping. She did not mind going out of doors now, as she used to do before the operation. She had no more cramps or trouble with her bladder. The headaches had disappeared and her limbs were normal. There were no neurological signs except, rather surprisingly, swelling of the optic discs with patches of chronic retinitis about the right disc, all of which made one wonder, privately, whether, though her vision was good, her illness was really at its end. However, at the next visit her optic discs were normal, with good vision ($^{6}/_{12}$) in each eye, and she has never since had any symptoms or signs of intracranial disease.

Her subsequent history was what one would have expected of a woman of strong character brought up in the East End of London. They sold their shop and took a public house, but her husband fell ill with gastric ulcer. She ran the business and looked after him. However, it proved too much for her, so they gave up the public house and took a shop again.

I have had a box of cigarettes from her each Christmas since 1931, and a letter which briefly chronicles the doings of herself and her family. Beneath the bare outlines one can discern the quiet and unassuming strength of a simple British housewife. In 1933 she had some trouble with her legs and feet; they were painful and she had difficulty in getting about. "The doctor ordered me to bed, not saying what was wrong with them; it was impossible to go to bed, so I had as much rest as possible and managed to keep about." How often, I wonder, does the patient respond in this way to medical advice about an undiagnosed minor ailment?

In 1936 she wrote that she was the only member of the family who did not wear glasses. In 1938 she was going to dances; she apologized for the smallness of my annual packet of cigarettes; her husband was out of work. In 1939 she wrote that she had not had one day in bed since leaving hospital in 1930, and had had no holiday for three years; her husband was in work again. When the war came she chose to see it through in London, as she had done in 1914-1918, notwithstanding the fact that they were bombed or blasted out of their house five times in all. Thus, in 1941 she wrote that the roof, doors and windows were all smashed, "but Hitler hasn't got me yet". In 1944 she became a grandmother and her husband had an operation on his stomach. In 1947, by which time both her daughters were married, her son came home from the army in the Middle East, "stayed at home for three months, and then packed up and went to New Zealand, said there was nothing to stop here for, so we are on our own again".

I should add that we were not always so successful as this with these hazardous operations. Some patients did not survive; or, worse still, at operation we could not do enough to relieve their symptoms and they went on living. There have been many disappointments in brain surgery and, though they become proportionately less frequent as knowledge and experience

grow, they do not disappear, for the limitations of the operative method have not yet been fully defined and are constantly subject to alteration with each diagnostic and therapeutic advance.

## THE NEUROLOGICAL DIAGNOSIS.

Let us trace now some of the paths of progress that led to the successful outcome in this case.

Firstly, how did we know when this patient came up with progressive weakness of her left arm and leg that she had a focus of disease in a particular part of the right side of her brain? This is knowledge about localization of function of the brain that has been gained largely by careful observation at the bedside and by animal experiment.

The fact that damage of one side of the brain produced epilepsy and paralysis of the opposite side of the body had been observed in Roman times, but no certain knowledge of localization of function existed until 1870. It is true that at the beginning of the nineteenth century an Austrian anatomist, Gall, and his pupil Spurzheim had put forward the idea that the brain was composed of two to three dozen different organs, each of which presided over different moral and intellectual tendencies; and that the size of these different parts of the brain, on which depended the predominating characteristics of the individual, could be inferred from the projections on the overlying skull. This was phrenology. It was exploited by quacks and did not gain general acceptance among scientific men, especially when the great French physiologist Flourens in 1820 affirmed from his experiments that there is no localization of functions of the hemispheres of the brain, and that the surface of the brain is inexcitable. After this for a long time it was thought impossible to pick out parts especially concerned with the different functions.

Meanwhile knowledge was being slowly built up by careful study at the bedside of patients—paralysed patients, epileptic patients and others—combined with examination after death in the fatal cases. Observations were gradually assembled, especially by the French physicians and surgeons, to show that disorders of such functions as speech, sight, movement and sensibility were related to disease in different parts of the brain. But cases were still being reported in which destruction of a considerable part of the brain by injury had been followed by no symptoms of any kind, and there was no certainty of views on localization until an English physician, John Hughlings Jackson, using the same simple methods of observation as all the other physicians, brought forward accurate ideas about the localization of function in different parts of the brain. By methodical and careful observations at the bedside, by reading and assessing the observations of others, by constantly pondering and striving critically to put the phenomena he studied under more general laws, Jackson produced a plan of the structure of the nervous system that has been confirmed to this day by all who have studied the brain by old and new methods.

It is doubtful whether Jackson was fully understood in his own time. And perhaps there did not seem need to understand him because of the experimental work that followed his papers. In 1870, while the German Army was invading France, two Germans, Fritsch and Hitzig, discovered that, notwithstanding Flourens's earlier work, the cortex or surface of the brain was excitable. By electrical stimulation of the brain cortex of animals they induced artificially involuntary movements analogous to normal movements, and other movements similar to those of what is now known as Jacksonian epilepsy.

After this discovery Flourens's experiments of removing parts of the brain were repeated more accurately, especially by Ferrier in England, and it was found that electrical stimulation of one particular part of the brain would always produce movements in one part of the body and that excision of the particular part of the brain was followed by paralysis of that part of the body in which movements had occurred on stimulation. Ferrier excised part of the brain in a monkey to produce weakness of the opposite arm and leg, and when Charcot, the great French physician, came to London in 1884 and saw Ferrier's monkey, he said in that graphic French way: "It is a patient."

From this experimental work enormous stimulus was given to the search for localized function in different parts of the brain. In part by experiments and in part by clinical observations the pathways for movement, sensibility, vision and so on were mapped out and shed a great light on the site of diseases in the brain. This work has steadily continued, contributed to not a little by brain surgery, and more recently by the neurophysiologists employing the modern electronic techniques for amplifying the tiny changes of electrical potential which accompany activity of all parts of the nervous system.

Behind all this work is the recurring question: What is the relationship of nervous activity and mental processes? What is the relation of brain and mind? What are the activities of nerve cells and fibres which correspond to such mental processes as memory, judgement and so forth? Where is the soul? In spite of the great increases of knowledge of how the nerve cells work, in spite also of numerous experiments on the human brain, albeit crude, which are inevitably undertaken by neurosurgeons in the relief of suffering, these questions are still unanswered. I doubt whether anyone has yet improved upon the conclusion of Hughlings Jackson in 1870, when, as a result of bedside study of patients and profound reasoning, he wrote:

> It is asserted by some that the brain is the organ of the mind and not a motor organ. Some think the brain is to be likened to an instrumentalist and the motor centres to the instrument; one part is for ideas and the other for movements . . . . But of what "substance" can the organ of mind be composed, unless of processes representing movements and impressions . . . ? What can an "idea", say of a ball, be except a process representing certain impressions of surface and particular muscular adjustments? What is recollection but a revivification of such processes which in the past have become part of the organism itself?

Thus, Jackson points out that, though the brain is for mental operations, the substratum or physiological basis of those operations is movement and appreciation of movement.

## THE DIAGNOSIS OF TUMOUR.

How do we decide that this lesion is a tumour rather than some other form of disease, such as blockage of an artery? Here again the knowledge has been largely derived from clinical study combined with pathology. At one time this meant only post-mortem examination, but surgery has given a tremendous fillip to precise knowledge of diseased states in relation to symptoms. There are other forms of evidence, one of which—the use of the ophthalmoscope—I chose to mention as an example of what has been done by the application of instruments of precision from scientific laboratories to the study of disease.

The ophthalmoscope was invented by an English mechanic, Charles Babbage, in 1847, but no one took much notice of his discovery until Helmholtz, a renowned German physiologist and mathematical physicist (1821-1894), rediscovered it in 1851. This instrument was for study of the

interior of the eyeball, especially of the retina and the head of the optic nerve in the retina. The optic nerve is really a prolongation of the brain—it is the only part of the brain that can be seen without a surgical operation. It becomes swollen in the presence of intracranial tumours, and this observation in our patient gave most important evidence of a different sort from that contained in her history of illness, evidence of a visual order that her lesion was a tumour.

Other "scopes" have since been invented—for example, cystoscope, gastroscope—and they have nearly all revolutionized the study of diseases of the organ concerned. The ophthalmoscope turned ophthalmology into an exact science. There is now a "scope" for nearly every hollow space in the body, but the invention of instruments of precision that can be used in diagnosis and treatment goes on. Each new advance in physics brings possibility of new light on disease. Among the more recent the amplification of electrical potentials and the development of cathode ray tubes that have made reception by wireless and television practicable, have rendered possible the detection and recording of minute electrical discharges in the brain. These discharges are altered in disease and analysis of the changes is proceeding.

## THE NATURE OF THE TUMOUR.

In our patient, though by no means in all cases of tumour of the brain, it was possible to forecast before operation that we were dealing with one particular type of benign tumour, a tumour that would not grow again after it had been removed, as cancer often grows, and one that would bleed a lot at the operation. This was made possible by the X rays, which showed in the skull certain markings of blood vessels that experience has taught us to associate with this particular type of tumour.

X rays were discovered fifty-three years ago (1895) by Wilhelm Conrad Röntgen (then aged fifty), professor of physics in Würzburg. He came in to dinner one night, so the story goes, in a very absent-minded state. His wife had prepared an excellent dinner, but he took no notice of this whatsoever and did not even notice that she was getting angry. So she had to ask him what was the matter and he told her—the only person he did tell—about his discovery. He, along with many other physicists, was working at that time on the cathode rays resulting from passage of electricity through rarefied gases, but it was Röntgen alone who discovered that when the cathode rays strike the glass wall of the tube or, better still, a piece of heavy metal inside the tube, a new sort of ray is formed which, though invisible, can cause certain substances, like barium platino-cyanide, to shine; and they have the same effect on a photographic plate as ordinary light. These rays penetrate not only the glass wall of the tube, but other substances which are opaque to ordinary light, like wood, flesh, and to some extent metals. The rays go through flesh more readily than through bones, and through the lungs which are filled with air more readily than through the heart filled with blood. And so by these Röntgen rays, or X rays, it is possible to see the outline of a bone and any breaks that occur in it, and to see the beating heart and measure its size, and so on. The parts to be studied can be watched by means of a fluorescent screen or can be photographed on a photographic plate. Some of the rays are absorbed by the body and give up their energy, and in this way the X rays are used for the treatment of cancer.

All the physicists working with Crookes cathode ray tubes were actually producing X rays, but Röntgen was the only one who discovered them.

He did this, apparently, by noticing, and realizing at once the significance of the fact, that a piece of cardboard painted with fluorescent material became faintly luminous in a dark room, although the Crookes tube from which the effect came was shielded by black cardboard. The rays penetrated cardboard. Röntgen recognized this at once as a perfectly new phenomenon and in about three months, spending day and night in his laboratory, had worked out most of the properties of X rays, and the medical world had a new weapon of diagnosis.

In our patients we could work out from our knowledge of the nervous system and without other aids the position of the tumour in the brain; in some cases we could do it accurately, in others we would be an inch or two out in our localization, and in yet others we would work it out wrongly. But the X rays show us the precise position of the tumour. It is like a cross-reference on the map of diagnosis. Further, in this case the X rays indicate the nature of the tumour and warn us that there will be great loss of blood at the operation.

It must not be thought that in every case X rays show the position of the tumour; in fact it is only in about 15% of cases that they do so. But where they are of no help and the position of a tumour cannot be determined by examination at the bedside, X ray examination after injection of air into the cavities in the interior of the brain usually indicates the position of the tumour. This method of study was introduced in 1917 by Walter Dandy, a young American neurosurgeon. He started with the idea of studying hydrocephalus, or water on the brain, in infants and, as so often happens, found unexpectedly that his method was much more useful for another purpose, namely, the localization of brain tumours. This method has greatly hastened the advance of brain surgery.

The application of X rays to medicine has been far-reaching and the uses to which they can be put are far from exhausted. As an example of recent work we may consider injection into the arteries of solutions opaque to X rays. In this way the arterial system can be seen and certain diseases of arteries can be recognized with much greater certainty than before. These are examples of exploitation of developments of physics by clinicians.

## TREATMENT.

We must pass over the discovery of the microscope and work on the minute structure of tumours, which has important bearing on our patient; and we must pass over also the story of the discovery of safe methods of blood transfusion, in order to leave time for considering the removal of the tumour.

As far as I know no one ever tried to remove a brain tumour before Lister introduced antiseptic surgery about 1866. In fact, the first recorded removal of a brain tumour was about 1880. The story of Lister's work is well known and I will therefore mention it only briefly. The story begins with the work on crystals by Pasteur, a young French chemist. At that time he had no more interest in medicine than Röntgen had when he discovered X rays, though in the end his work on bacteria led him to the study of human infections with profound benefit to mankind. At the time we are considering Pasteur was simply interested in the way crystals change from one form to another and this led him to study fermentation in beer and wine. In the course of his work he discovered and was able to cultivate microorganisms. At this time Lister was practising surgery in Glasgow and was more dissatisfied than most surgeons at the frequent onset of infection—erysipelas, lockjaw, hospital gangrene and the like—both in wounds due to accidents and

in wounds due to operation. As Clifford Allbutt has said: "Lister came into the surgical world of laudable and ichorous pus—the world of Brodie, Paget and Syme". No one had been able to understand why open wounds went septic while injuries in which the skin was not broken did not go septic. Lister, along with other surgeons, said it was decomposition brought about by the influence of the atmosphere on the blood in the wound. He thought it was due to the oxygen of the air and tried to exclude this by bandages. Then Thomas Anderson, the professor of chemistry at Glasgow, happened one day to draw Lister's attention to Pasteur's paper on fermentation. Lister read the paper and he was so closely in touch with his own problem that he saw at once that the septic property of the atmosphere depended not on oxygen or other gases in the air, but on the organisms in the air. For him, then, it was a short step to try the effect of chemicals in the dressings, in the hope of thus excluding bacteria from the wound. He failed with zinc chloride and sulphites, and then succeeded with carbolic acid, which he had heard of as being used with success at Carlisle to disinfect sewerage. He published his first paper on the antiseptic principle in 1867, and thus opened the flood-gates of surgery. It is remarkable how apparently casual was the initial contact between Lister and Pasteur. One can imagine Lister and Thomas Anderson walking away from a meeting of the university senate at Glasgow and Anderson saying: "By the way, have you read a rather interesting paper of Pasteur's?"

The brain has been called the Mount Everest of surgeons, and it is not surprising, therefore, that surgeons did not tackle brain tumours until 1880, when the surgery of most other parts of the body was well under way. The most important pioneer work in brain surgery was done by two men in Britain, William Macewen, of Glasgow, and Victor Horsley, of London. After thirty years of hard work on the part of these and other workers the mortality from operations for brain tumour was still 50%. In the next fifteen years, and especially after the first world war, largely owing to the work of Cushing in America, the mortality was reduced to 15%; and now it is down to 10% and should go lower.

## THE RECENT CONTRIBUTION OF NEUROSURGERY.

Lister's discovery did not eliminate infection in clean operations in the brain. Application of the recent discovery of penicillin to brain surgery has further reduced the incidence of sepsis, though it has not abolished it. By other means also neurosurgeons have obtained a steady improvement in their results in treatment of brain tumours: by improved use of blood replacement during operations, by numerous technical advances which it would take too long to describe, by better knowledge of how to avoid and to treat post-operative lung complications, by increasing knowledge of the adjuvant use of X-ray therapy, and so on. Operations on tumours such as I have described are now much less hazardous than they were seventeen years ago. In addition, neurosurgeons have made numerous advances in the treatment of aneurysms, injuries and infections of the brain and meninges, and in the relief of painful states by the division of pain pathways in the brain and spinal cord; and with the operation of frontal leucotomy neurosurgery is making a liaison with the field of psychiatry. I have not mentioned the neurosurgical work on the spinal cord or on more peripheral parts of the nervous system, but I think I have said enough to indicate that neurosurgery is a field which is still expanding. Although it is what is called a specialty, it is in no sense a narrowing field of endeavour, for the neurosurgical aspirant must keep in close touch with medical neurology, psychiatry, ophthalmology, neuropathology, radiology and numerous other branches of

medicine, as well as with other divisions of surgery. In the second world war neurosurgeons demonstrated their ability to advance knowledge and to make practical contributions in their own field of work, as well as to elaborate principles and to devise methods which were of use in other branches of surgery.

## GENERAL APPLICATIONS.

I say this in no sense of boastfulness, but to make the point that the vitality of neurosurgery or of any other field of endeavour depends upon its progress. Without progress any branch of knowledge will cease to attract younger men of ability, and that is one of the reasons why the primary function of a university must always be research—the pursuit of new knowledge. Teaching should as a rule go hand in hand with research, the best teaching of all being that which by example inspires the pupil to undertake research—"teaching by infection", as it has been called.

However much we may deplore the development of specialization in medicine, as in other fields of knowledge, the fact remains that the advances are being made by those who particularize on some aspect of medicine. I have dealt with only a small field of medicine; advances much more interesting and dramatic could have been put before you by someone whose work is with thoracic surgery, or with disorders of the ductless glands, or with infectious diseases, diseases of the blood and so on.

How can the undergraduate student hope to become proficient in all these branches of medicine? It is an impossible task and all that we can hope is that he will receive a thorough grounding in the clinical method, a method which is the foundation of all work with patients; that he retain a basic knowledge of physiology, biochemistry and pathology without which detailed study of any branch of medicine is profitless; and that he will be inspired by his teachers to remain a perpetual student of disease in man. So equipped, he should be able to work effectively in whatsoever field of medicine towards which his interests and aptitudes may lead him. And is it not this equipment rather than the sum total of his knowledge which should be tested at the qualifying examination?

There is one aspect of progress that is apt to be forgotten, and that is in the spirit of humanity with which the sick are treated. There have always been men like Syme who treated all their patients as individuals, but I think that, particularly between the two world wars, there was a more general spirit of kindness and honesty in the way that doctors and nurses dealt with their patients than prevailed before the first world war.

Surgery is and must always remain an art, but its progress and thus its vitality depend on the maximum application to it of the methods and discoveries of science. If we return to my patient and attempt to analyse the pathways along which advances leading to a successful outcome were based we see that there were several. There is first the observation of disease at the bedside and in the post-mortem room. This sometimes leads to great though rarely dramatic discoveries, as in the case of Hughlings Jackson. This method of study will always be necessary. It defines the problems of disease, and there are many that are still undefined, the more so as diseases, or perhaps I should say diseases in patients, are always changing.

Then there is the method of experiment, which to a certain extent overlaps the first method, for a disease is in itself an experiment on man. The experimental method on animals is practised in laboratories by two groups of workers. There is one group which pursues knowledge of the normal structure and functions of the body for its own sake, usually without any immediate stimulus from the problems of disease. In this group come

Fritsch and Hitzig, who first discovered that the surface of the brain is excitable. And there is another group of workers, who go to the laboratory to solve difficulties they have had in the handling of their own patients. In this group we may put Walter Dandy, who tried to discover how to deal with water on the brain in infants and ended by discovering an important way of localizing tumours of the brain.

And then there are the methods of pure science, carried out by physicists and chemists remote from the wards and laboratories of medicine, by men like Röntgen and Pasteur. The influence of these men on medicine is usually for them entirely fortuitous, though their discoveries and their instruments and methods are often of the greatest value to those who work in clinical subjects.

In summary, the successful result obtained in the patient whose illness I have described depended on the work of the physicist, the chemist, the physiologist and the neurologist, and indeed on workers in other fields as well as on the neurosurgeon. I think one can with fairness say, and without decrying the essential work of the surgeon—both his art and his application of scientific method at the bedside and in the operating theatre—that surgical progress depends as much on the basic sciences of physics and chemistry and on the use of the experimental method as on the long-established methods of clinical observation. The lessons here surely are that the surgeons of tomorrow must be thoroughly grounded in physics and chemistry; that a reasonable proportion of them should be encouraged to obtain extra post-graduate experience in subjects related to surgery, such as pathology, bacteriology, physiology, anatomy *et cetera,* before they give themselves over exclusively to the practice of surgery; and that some reward should be given to young surgeons for success in original investigations. We need a blend of craft and thought.

There is nothing unconventional about these doctrines; it is only that perhaps they need to be taken to heart more than in the past. In the early part of this century the educators were preoccupied with the relationship of medicine and surgery. The outcome has been that surgeons have learned "medical" sagacity and that meanwhile science with its "increasing knowledge and control of the materials and forces of nature" (to quote K. T. Compton) has quickened surgery no less than other branches of medicine.

Lister opened up such a wide field of operative surgery that surgeons became more uniformly operating surgeons with relatively narrow fields of interest than in the pre-Listerian days. Surgery has always received so much of its vitality from other subjects that uniformity and exclusiveness in surgical education cannot be in the best interests of the subject.

I would suggest that the key move is in the treatment of young surgeons. Without sacrificing in any way the training in the art of surgery on which surgical practice must ever depend, it should be possible by educative measures and rewards to encourage young surgeons to carry out original work, for it is on this in the final analysis that the vitality of this College and all other guilds of surgery will depend.

# PRESIDENTIAL ADDRESS.[1]

By F. Gordon Bell,
*Dunedin.*

It is appropriate that the Royal Australasian College of Surgeons should hold its twenty-first annual general meeting in Dunedin, for it was here in 1927 that the founders met and launched the College. Dunedin surgeons and citizens alike should recall with pride the notable part played in the inception and planning of this new enterprise by Louis Edward Barnett; we pay a silent tribute to the vision and tenacity with which he and others of a like mind pursued their cherished ideal of a College of Surgeons for Australasia, having as its vital purpose the advancement of surgery. Any young professional institution derives its future strength from the ideals inculcated and from the standards set by its founders, and for none is this truer than for the Royal Australasian College of Surgeons.

Once again Australian and New Zealand surgeons forgather in Dunedin on professional affairs and to transact the business of the College. We in New Zealand most heartily welcome our Australian colleagues and regret that difficulties of transport have prevented their attendance in the numbers we would have wished. Failure of sea transport has also prevented the attendance of eminent colleagues from the Mayo Clinic, much to our disappointment.

## Review of Twenty-One Years' Progress.

It is appropriate too, at this anniversary, briefly to take stock of what has been accomplished in our years of minority.

### *Numbers.*

The number of Fellows has grown to include a total to date of 658—530 Australian, 128 New Zealand. The majority are general surgeons, but it is the Council's policy to foster the development of specialist groups within the College.

### *Headquarters.*

The young College was supremely fortunate in obtaining a magnificent building site in the heart of Melbourne and now has reason for pride in the simple architectural elegance of its headquarters. This building is the administrative centre, and in addition to the large lecture hall, council room and offices, houses the Gordon Craig Library and the Cowlishaw Historical Collection. Bricks and mortar, however imposing, may mean little; it is the spirit within that counts, and over and above the literary and historical treasures just mentioned, it is fair to claim that in a very short space of years College headquarters is already a hub from which radiate many fertilizing scientific and educational channels.

### *Educational Developments.*

In the early years educational developments centred around regular professional meetings, the development of a high-class surgical journal and the building up of a library; but as the years passed these educational

[1] Delivered at the twenty-first annual meeting of the Royal Australasian College of Surgeons, January 27, 1948.

activities have been greatly extended and the College has recognized as a primary duty its responsibility to provide for the education of promising young surgeons. We owe a profound debt in this regard to the splendid benefaction of a Foundation Fellow, the late Gordon Craig, of Sydney. From this endowment, wisely administered, have come many Gordon Craig scholarships, tenable in Australasia and abroad, which have greatly assisted in the education of a new generation of Australasian surgeons.

Furthermore, the Council has long been alive to the importance of a post-graduate hospital and now, happily, the new Prince Henry's Hospital in Melbourne has come increasingly within the College orbit as a centre for post-graduate education. During 1947 courses of clinical and operative instruction were organized and conducted by eminent teachers, to the great benefit of aspiring surgical graduates. Further courses of instruction by prominent teachers have been arranged for 1948 and will go on throughout the year. There can be no doubt that this development will quickly assume a high practical importance in the educational programme sponsored and directed by the College.

### *Examination System.*

Two years ago the College discarded former methods of admission and set in operation a more formal two-part examination system based on that for the diploma of Fellow of the Royal College of Surgeons of England. No candidate is eligible to enter for the final examination till at least five years from date of graduation, and only after submitting to the Censor-in-Chief proof of having undergone a comprehensive practical training in surgery, of which the keystone is a progressive apprenticeship under supervision. The Royal Australasian College has thus adopted a most stringent standard of regulations and is unique in its insistence on adequate apprentice training to ensure that the diploma F.R.A.C.S. carries a guarantee of high practical competence.

For the benefit of ex-service candidates the Council has this year modified in some degree the regulations governing eligibility to enter for the final examination. These concessions, which do not invalidate the high standard of the examination, will obtain for a sufficient period to allow ex-service men every chance of becoming Fellows. The Council believes that this consideration afforded those who have served their country will command the approval of all Fellows, and will provide a valuable accession of talent to the College junior ranks. The New Zealand Court of Examiners for the final fellowship examination has just completed a series of examinations and the successful candidates will be formally admitted to the College this evening. This, I may say, is the first occasion on which the new type of final examination has been conducted in New Zealand.

### *The Louis Barnett Hydatid Registry.*

Sir Louis devoted the twenty years of his retirement to the building up of the Hydatid Registry as an important part of the College's research activities and one likely to throw additional light on a disease still so common in our great sheep-raising countries. At the time of his death the Registry had grown to include approximately 2,000 clinical records of hydatid disease drawn from Australia and New Zealand. The Council has decided that the work of the Registry shall be carried on, and as a tribute to Sir Louis's devotion it is now entitled "The Louis Barnett Hydatid Registry". The Council has further decided that the time has come for analysis and publication of this vast and unique collection of records and has allotted this task to New Zealand Fellows. The Registry has been

transferred to Dunedin from College headquarters and the work of analysis has begun in the large group of pulmonary cases, on which a preliminary report will be submitted during our professional meetings. It is the Council's hope that the essential facts emerging from a study of the Hydatid Registry as a whole will ultimately be assembled in book form, to be available to surgeons all over the world; sections will be published in THE AUSTRALIAN AND NEW ZEALAND JOURNAL OF SURGERY as they come to hand.

So much, then, for a cursory review of the developments over the first twenty-one years. We may regard them as satisfactory and holding promise that the Royal Australasian College is destined to play an increasingly useful part in the surgical and scientific welfare of our countries.

## COMMONWEALTH TRAVELLING PROFESSORSHIP.

This meeting is memorable for the inauguration of the Commonwealth Travelling Professorship so generously endowed by Mr. Arthur Sims and his family, of Christchurch. This magnificent gift of £50,000 sterling is held in trust by the Royal College of Surgeons of England, and the annual selection of the professor is in the hands of an advisory council consisting of the presidents of the Royal Colleges of Surgeons and Physicians in London and those of Australasia. As for its purpose, let me quote Sir Alfred Webb-Johnson, President of the Royal College of Surgeons of England. He writes:

> The Council have always been anxious to foster the closest possible relationships between the Royal College of Surgeons of England and the sister Colleges in the Dominions. They therefore rejoice in the institution of a Commonwealth Travelling Professorship which will provide for prominent teachers of Medicine and Surgery to make tours of the Commonwealth and Empire in order to take part in research and post-graduate education.

I may here inform you that the Commonwealth Professor for next year is likely to be a distinguished physician.

To resume: Team work is the keynote of modern surgery. Mr. Sims and his wife and daughter work as a team, and when a lay team has the vision to conceive, and the generosity to endow, a professorship fraught with such beneficent possibilities of advancing medical welfare within and beyond the Empire, it is truly something over which to rejoice.

We are delighted to welcome as the first Commonwealth Professor, Sir Hugh Cairns, the distinguished Nuffield Professor of Surgery at Oxford, than whom no better choice could have been made. In addition to his eminence in his own field of surgery, Sir Hugh brings to us the high recommendations of Australian birth and devoted services to the Allied cause in the recent war. We are honoured to have him commence his tour of duty in New Zealand and have no doubt that the cause of neurological surgery here and in Australia will greatly profit by his visit, as it will in Canada and South Africa later in the year.

The Commonwealth Professorship in the person of Sir Hugh Cairns has a deeper significance than the purely medical aspect, inspiring and full of promise as that is. All of us who, like the donors, ardently believe in the mission and in the future of the British Commonwealth of Nations confidently hope that it will provide another insoluble link binding us together in the difficult times ahead.

# TREATMENT OF BILATERAL RENAL CALCULI.[1]

By M. S. S. Earlam,
*Sydney.*

The treatment of bilateral renal stone is on some occasions fairly well standardized and uniformly accepted, and on others a subject of considerable difficulty or controversy or both. The patient in the former category, who has one or more calculi of average size in each kidney, and whose treatment is reasonably straightforward, I do not propose to discuss today. Nor shall I spend any time on those patients in whom the primary urological lesion is an obstructive one and in whom the removal of the obstruction, whether by plastic surgery or other means, is the essential feature of any surgical procedure and the removal of the stone or stones a secondary one.

The conditions with which I propose to deal today are essentially those in which there is no demonstrable obstruction and in which, so far as the urinary tract is concerned, the stone formation is the primary lesion. In particular I shall refer to those patients in this group in whom, by reason of their size, number and location, the removal of the stones by any measure short of nephrectomy constitutes a major surgical problem. Such patients are those with staghorn calculi, decubitus calculi and, on occasions, urate calculi. I shall also mention briefly another condition, chiefly remarkable for its interest and rarity, namely, parenchymal calculosis. Of parathyreoid tumour, which in countries with populations of the order of that of Australia is excessively rare, I have had no experience.

## Bilateral Staghorn Calculi.

Surgical removal of a staghorn calculus is always a difficult and often a hazardous procedure, and for this reason many surgeons favour conservative treatment. I myself was taught that the treatment of staghorn stones was nephrectomy or nothing, and patients with this condition do live for years in quite reasonable comfort. At the same time, the term "silent" so commonly applied to these stones is a misnomer. Silent they may be for long periods as regards any symptomatology, but they are far from silent in the insidious and progressive damage they inflict on the renal parenchyma. All of them, or practically all, become infected sooner or later, the onset of infection increases the rate at which kidney damage occurs, and the great majority of patients who harbour them die long before their time from sepsis and renal insufficiency. Most patients whom we see in this category are beyond surgical aid.

If, however, the patient is seen early, before the onset of infection and of any appreciable degree of renal insufficiency, my feeling is that surgery should be seriously and routinely considered. Conservative treatment, if one may so term it, is tantamount to acknowledging that although the patient is almost certainly going to be dead within ten years one is not prepared to attempt to do anything about it; and I feel very strongly that a young patient with bilateral staghorn calculi and a clear urine should, if at all possible, be given, by operation, the only chance he has of living anything like his allotted span. Operation is admittedly not easy and is fraught with some risk to life, but with adequate resuscitation and modern chemotherapy

[1] Accepted for publication on June 12, 1947.

the risk is certainly less than it was in the past, and I do not think that any of these people should be condemned to conservative treatment, with its attendant certainty of early demise, without full thought being given to the serious implications of the advice.

Surgical treatment of staghorn calculi can most conveniently be considered under three headings: (*a*) pre-operative assessment, (*b*) operation, (*c*) after-treatment, immediate and long-term.

### *Pre-Operative Assessment.*

The assessment of the suitability of a patient for operation is often a matter of some difficulty. The three principal criteria are the state of the kidney function, the presence and degree of urinary tract infection, and the patient's age and condition generally. A patient with pea-soup urine and enormous bilateral stones is obviously unfit for any attempt at surgical cure and will live longer without operation than with it. A patient in his fifties or sixties in good condition with no infection is also hardly a candidate, while on the other hand it may be unfair to deny operation to a similar patient in his twenties. For operation to be indicated I think the patient should be reasonably young, have a reasonably clear urine and a renal function which is normal or approximately so. Operation can be a prolonged affair, and a patient with infected urine and an impaired renal function stands it badly. Two criteria in the assessment of such a patient are: (*a*) The size and degree of complexity of the calculi. In general the larger the stones and the more complicated the branching, the more destruction of kidney tissue has taken place. (*b*) The kidney shadow. Often one can see by the skiagram that a good thickness of renal parenchyma still exists, which, all things being equal, favours suitability for operation. Conversely, if the kidney shadows are ill defined or absent, it may well indicate a merging of the cortex with extensive perirenal inflammatory change and advanced cortical destruction.

Each patient has to be taken on his or her merits, all the various factors have to be weighed, and a decision for or against operation made. Too often, unfortunately, the degree of infection and of renal damage is such that any attempt at cure is unjustifiable. Sometimes, with a reasonable state of affairs in one kidney and advanced disease of its fellow, conservative surgery of one side and opposite nephrectomy may be the solution. Occasionally bilateral operation is possible, and when possible I think it should be done. Occasionally a partial removal of the stone and permanent nephrostomy may tide the patient over a crisis and prolong his life.

### *Operation.*

First of all, no operation for renal stone which is liable to be difficult or prolonged should be carried out unless the surgeon has given due thought to the question whether the patient requires blood transfusion before operation, during operation or both.

Secondly, if the urine is infected, chemotherapy in the form of one of the "sulpha" drugs or penicillin, or both, has to be applied as indicated, and many of these patients derive, I am sure, tremendous benefit if operation is carried out while they are saturated with one or both of these drugs. The place of streptomycin, one feels, is rather after operation than before or during it.

*Exposure.*—Exposure is extremely important. All of us at different times have done kidney surgery, under considerable personal strain, with exposure

that has been far from ideal. One can almost always remove a kidney under these conditions, but for an extensive operation for stone the exposure should be the best that is obtainable, and the efficiency of exposure may make all the difference between success and failure. If the kidney is at all on the high side and there is any indication that the slightest benefit will ensue, I feel most strongly that the twelfth rib should be resected and, furthermore, not after an attempt at operation through the normal incision, but as a planned operation through an incision made along its axis. With this high incision there is as a rule no swinging down of the kidney on its pedicle. It is simply lifted into the wound. This exposure has, I think, one further advantage, and that is that if one employs it the operation proceeds, at least up to a point, exactly as planned, and the surgeon will commence the actual removal of the stone in, shall I say, a somewhat less unsettled frame of mind than would have been the case had he tried to carry out operation through the usual incision and found it inadequate.

FIGURE I.

*The Surgical Approach to Removal of the Calculi.*—Here again a methodical approach is essential. The skiagrams will furnish a fairly accurate idea of what removal of the calculi is going to entail, and operation is planned and executed accordingly. In some cases it is apparent that all, or practically all, of the stone can be removed through the pelvis. In others it is apparent that, whereas most of the stone can be removed through a pyelotomy, nephrotomy in some degree will be required. On other occasions again it is obvious that the stone cannot be removed by any measures short of extensive nephrotomy. Control of bleeding from a nephrotomy incision is not usually a matter of extreme difficulty. Plain interrupted sutures, I think, are rather preferable to mattress sutures, and the use of "Oxycel" has much to commend it.

*Removal of the Calculus.*—Complete removal of the stone is all important and the great majority of recurrences are due to neglect of this principle. A comparison of the stones removed with those in the skiagram may suffice if there are one or two calculi of small or moderate size only; but if the stone formation is at all extensive this method is quite unreliable. Figure I illustrates this fact. I removed most of this right renal stone and was fairly satisfied that there were perhaps one or two pieces left. A skiagram taken on the spot showed no less than five. The only certain way of ensuring that the stone is completely removed is by X-ray examination in the theatre, and this should be carried out whenever the slightest doubt arises.

There is no short cut to complete removal. Irrigation of the pelvis and calyces through a small catheter is often done, but cannot be relied on. Joly considered it to be actually harmful in that all it did on occasions was to drive calculous fragments into the minor calyces.

One technique worthy of mention, however, is the fibrinogen-coagulum method recently evolved by Dees, which in selected cases should be extremely useful in removing small stones or stone fragments hard to pick up by ordinary means.

Most fragments of any size, however, will usually have to be removed the hard way, either through the neck of the calyx in which they lie or through a short cortical incision directly over them, and the result should be checked by X-ray examination on the spot. If for any reason this is not done, the patient, as one authority has stated, should have a skiagram taken before leaving hospital, no matter how embarrassing this may be.

*Drainage.*—My own practice is to drain by nephrostomy on practically all occasions when a nephrotomy has been carried out. In the first place this provides the most efficient and direct means of affording free post-operative pelvic drainage; secondly, post-operative irrigation of the pelvis can be most easily and efficiently carried out through a nephrostomy tube; and thirdly, because the biggest risk attendant on nephrotomy is that of secondary hæmorrhage. If free drainage is present the blood can get away and the bleeding will usually stop in due course. If not, however, clots may distend the pelvis and the patient rapidly reach a condition of acute distress. For this reason I am extremely reluctant to remove the nephrostomy tube in less than twelve to fourteen days.

*Fixation of Kidney and Ureter.*—Some type of fixation of the kidney is a help, if there is a nephrostomy tube in position, in keeping the drainage track in the kidney directly opposite that in the abdominal wall. It is held by some that kidney fixation is desirable as a general routine, in helping to overcome minor degrees of deficient pelvic drainage, of little ætiological significance in regard to the original calculus formation, but of greater potential importance in causing stone recurrence in the presence of infection. My own feeling is that whether or not the kidney is securely fixed in a high position on a long-term basis is not of great importance. One certainly finds at secondary operations that it is well and truly fixed, at an uncomfortably high level, by natural means. A nephropexy, however, is a procedure that will certainly do no harm if the surgeon prefers to do it.

Splinting of the ureter is a procedure which I feel we should perhaps employ more often. It eliminates the possibility of kinks due to post-operative scarring and ensures fairly direct drainage from pelvis to virgin tissues below. I personally like to employ it, particularly with the kidney which has practically no extrarenal pelvis and in which a fairly long incision has been made in the upper part of the ureter just outside the hilum. My own practice is to leave the splint in position for three weeks, exactly half the time stated as being necessary by most American urologists after plastic procedures, but a period which is regarded as adequate by local plastic surgical colleagues.

### *After-Treatment.*

*After-Treatment in the Immediate Post-Operative Phase.*—Copious fluids should always be given as a routine measure. Chemotherapy in the form of penicillin or one of the "sulpha" drugs may be called for to deal with acute post-operative renal infection. The place of streptomycin is difficult to assess at the moment, but my personal feeling is that it is not specially indicated at this particular phase in the average subject.

As regards local treatment, post-operative irrigation through the nephrostomy tube, if present, is a routine measure. If any calculi or fragments are known or suspected to be present, the medium used should be an acid solution such as "Suby G". This, however, has to be used copiously

if it is to work at all, and, particularly if the pelvis is small or practically absent, it is a very much more difficult matter for a renal stone to be continuously bathed in an excess of solution than is the case with a stone in the bladder. This is hard enough if the stone is in the pelvis, and more difficult still if it is located in a calyx into which urine is being continuously secreted. A periodical irrigation with a few ounces of "Suby G" is quite useless. It has to be run in by continuous drip, through a ureteric catheter passed either in the usual manner or through the side wall of the nephrostomy tube. Even under these conditions I have had little or no success with it on the isolated occasions on which I have used it in the treatment of renal stones. To alternate it with urease may give better prospects of success. One virtue, however, of "Suby G" solution is that it represents practically the only means by which the urine can be kept acid in the presence of alkaline infections due to urea-splitting organisms and the growth of these organisms accordingly inhibited. For this reason I consider that its use should be a routine practice following operations for calculi complicated by such alkaline infections.

One point that should be mentioned here is the ease with which a nephrostomy tube may come out. I am not very happy about using catheters of the de Pezzer and Malecot type, as I have seen quite alarming hæmorrhage follow dilatation of the nephrostomy track. Balloon catheters are a help, but in a kidney with a small or absent pelvis cannot always be used. I have been in the habit of using ordinary rubber tubing in most cases, or a standard nephrostomy tube. The chief drawback is that unless the nursing staff is very attentive, the first indication that the suture anchoring the tube has cut through may be when the patient turns over in bed and the tube comes out, and despite all precautions taken at the time of operation, it may be a matter of extreme difficulty to reintroduce it if it comes out during the first week or two after operation. For this reason the importance of the maintenance of the tube in position should be impressed on the nursing staff.

*Long-Term Treatment.*—In long-term treatment control of infection and the prevention of recurrence of calculus formation have to be considered.

1. Control of infection. "Sulpha" drugs and free fluids are exhibited as indicated. Coccal infections are not very common, but, if present, they call for penicillin therapy. Streptomycin, I think, will probably find a place in the treatment of some infections. I would say on the present evidence available, which is not very great, that if the infecting organism is streptomycin-sensitive, a course of the drug could with advantage be seriously considered at a fairly early phase after complete removal of all calculi has been carried out.

2. Prevention of recurrence of calculus formation. As I have already insisted, most recurrences are not true recurrences at all, but are due to incomplete operation. After complete operation a permanently increased fluid intake is of course indicated. Apart from this, other long-term measures have to be considered with the object of keeping the stone-forming crystalloids in solution as far as possible. The principal necessity here, staghorn calculi always being phosphatic in composition, is some means of keeping the urine acid.

In this respect the acid ash diet can be most valuable. Figures II and III show an extremely satisfactory result following its use. Figure II shows the pre-operative skiagram. The patient had a large calculous pyonephrosis on the left side, requiring two-stage nephrectomy and also had very obvious calculus formation on the right. Figure III, taken some nine months after left nephrectomy, with the patient consistently on an acid-ash diet, shows complete disappearance of the calculi previously present on the other side.

The trouble with the acid-ash diet is the fact that it can be extremely monotonous for the patient, with its minimal amounts of fruit and vegetables. Some intelligent and conscientious patients cooperate fully and do not depart

FIGURE II.

FIGURE III.

from it, but quite a few take liberties and impair their chances of getting their reward. One aspect, too, of the acid-ash diet that has received attention as a likely disadvantage is the fact that, while increasing calcium solubility,

it also increases its excretion. On present evidence it is not entirely possible to state categorically in what proportion of cases, if any, the increased calcium solubility is offset and outweighed by its increased excretion.

Other means of urinary acidification can of course be employed, as for instance the administration of ammonium chloride or sodium benzoate. I have on occasions used the former, giving it in capsules, and there appears to be no reason why any patient whose renal function is adequate cannot take these drugs for indefinite periods. My own feeling is that with the average patient this method is less troublesome and monotonous than the acid-ash diet, and achieves exactly the same result.

As regards diet again, although the part played by hypovitaminosis in the human subject in the formation of stone may not be a large one, an adequate vitamin intake should on general principles be maintained, and this

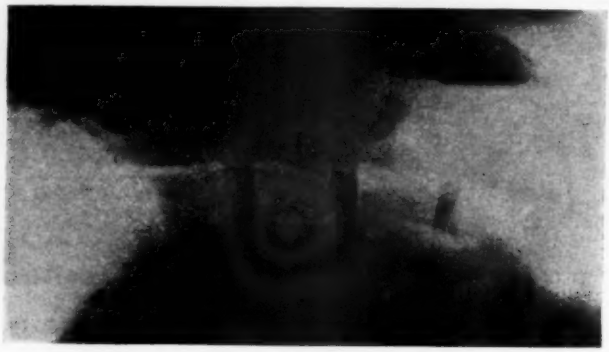

FIGURE IV.

can be done more easily on a liberal diet with chemical urinary acidification than with an acid-ash diet which is deficient in vitamins and requires their specific addition.

I believe that, in the average case and in the present state of our knowledge, no other long-term measures aimed at preventing calculus recurrence are specifically indicated. Such measures as stilbœstrol and "Amphojel" administration may at times be of considerable use, but rather on a shorter term basis, as will be discussed below.

One tremendous drawback in Australia in deciding what is the best thing to do with these people is the fact that the size of our population does not permit any surgeon to see them in any considerable number. Most of us have an occasional case only to contend with, and the best we can do is to apply such treatment as has been worked out in other parts of the world, in the light of much more concentrated experience than any of us are likely to obtain, and as seems most likely to produce the result at which we aim.

## DECUBITUS CALCULI.

The possibility of the formation of decubitus calculi during periods of immobilization has been much more widely appreciated of recent years than formerly. Their cause is twofold. In the first place, in a patient at complete rest, the everyday physical stresses and strains that are the normal stimulus to osteoblastic activity cease to operate, while osteoclastic activity proceeds as usual. The result is partial decalcification of the skeleton and an increased calcium output in the urine. The second cause is stasis in the renal pelves

and calyces. It is perhaps not generally appreciated how very bad the drainage from the kidneys really is under these conditions, and Figure IV shows a lateral pyelogram, taken with the patient lying on his back, illustrating this point. As one would expect, decubitus calculi are characteristically multiple, and the principal difficulties in their treatment are due to their number and their tendency to become impacted, rather than to their size.

In some cases not much harm is done. The urine remains clear and when the period of bed rest comes to an end the patient proceeds to pass all his calculi and has no further trouble. Such cases, however, are all too rare. Only too often, and especially if the primary surgical condition is accompanied by urinary tract infection, kidney infection supervenes, and the first clinical indication that calculi have formed may be an attack of colic followed rapidly by acute surgical kidney due to calculus impaction. This is prone to occur, naturally enough, the first time the patient gets up.

The condition may be a desperately difficult one with which to deal, as the cases of the following two patients will show.

FIGURE V.

The first was a young officer who had a gunshot wound through his bony pelvis and bladder and had after prolonged immobilization developed multiple decubitus calculi in both kidneys. When I took him over he had just had his bladder repaired by Mr. R. J. Silverton, and drainage was being carried out by cystostomy. I was hoping to allow his cystostomy opening to close in due course, then to remove the stones and get him up. He was wasted and his general condition could only be described as poor. However, he forced my hand by having an attack of left renal colic, followed rapidly by all the clinical indications of acute surgical kidney, and about forty-eight hours after his pain started I was forced to expose his kidney, a matter of some difficulty, as it was acutely engorged and even at this early stage had some pus outside it. I succeeded in removing a number of calculi, which, so far as I could see, corresponded exactly with the number in his skiagram, and, of course, carried out a nephrostomy. A post-operative skiagram, however, showed a small calculus still present, on which about ten days' continuous irrigation with "Suby G" had no apparent effect. I intended to allow drainage to continue through his nephrostomy opening until the time arrived to get him up, but the tube came out, and an effort to reinsert it on the spot produced a most copious and alarming hæmorrhage, which went very close to requiring nephrectomy. First his nephrostomy and then his cystostomy wounds broke down, and any further surgery became out of the question for several months, after which I perforce turned my attention to his right kidney. I would have preferred to delay operation further, as he was in no fit state for major surgery, but attacks of colic forced my hand again. Rightly or wrongly, I decided against an X-ray examination in the theatre on account of the time element with a sick patient, with the result that I left one stone behind. Also during the twelve hours prior to operation he complicated matters by passing two stones down to the pelvic part of his ureter, which I did not attempt to get. Some weeks later I removed these two ureteral calculi, excising a suprapubic fistula at the same sitting, and later again his remaining renal stone moved to the mid-ureter, whence it was removed. He is now up and about and extremely well. His right kidney is clear, but his left now contains two large calculi and is functionless.

The other patient was a miner who sustained a fractured pelvis, ruptured bladder and ruptured urethra. Several weeks later he developed a right perinephric abscess, which was incised, healed and discharged again, and at this stage he came under my care. I succeeded in getting his cystostomy wound healed, after which he had an attack

of left renal colic and an acute surgical kidney. Figure V shows the state of affairs at this time. He had multiple bilateral calculi, of which one was impacted at his left uretero-pelvic junction. I succeeded in getting a catheter past this stone, which tided him along for a couple of days, and then exposed his kidney under cyclopropane anæsthesia. He was still extremely ill and, whether or not by attempting too much speed, I made a tear in his peritoneum while freeing his kidney. Without further ado, therefore, I closed this and did a blind nephrostomy. He went straight ahead after this until the time arrived when I had to decide what to do next. Not altogether looking forward to further operation on his left kidney, I thought that an attempt to visualize and crush the stones through the nephrostomy would at least do no harm. I therefore passed a Lowsley ronguer forceps into his pelvis, crushing and removing quite a large number of fragments. A week later I repeated the procedure, removing some fragments, after which the remainder passed down his ureter and were passed without trouble. Figure VI shows his skiagram six months later. He remains extremely well.

Both these patients illustrate the fact that once the calculi have been dealt with and the factors that were responsible for their formation have ceased to operate, the tendency is, as one would expect, for no recurrence to occur.

FIGURE VI.

The most important consideration in the treatment of decubitus calculi is their prevention. Too often does it happen that an attack of colic turns attention for the first time to the urinary tract of a patient in whom urinary pathological change may have been present for weeks past.

The two most important details in the prevention of these stones are the copious use of fluids and frequent movement. The critical period, which is that immediately following the injury, should receive special attention, and patients should, whenever possible, take their fluids by night as well as by day. Patients also, when possible, should be turned from side to side at reasonable intervals and the head of the bed can also well be elevated for a specific period of time each day. This routine is followed in the poliomyelitis cases at the Royal Alexandra Hospital for Children. Acidification of the urine has to be considered, but as the usual measures for this tend to increase an already abnormally high calcium excretion, one feels that they should be avoided as far as possible in the early critical period, and reliance placed on fluids and movement, with avoidance of such articles of diet as fruits and fruit juices as tend to render the urine alkaline. As a working routine the above should be sufficient and the problem is to arrive at a routine which is reasonable for the ward staff to carry out and in which the effort expended is not out of proportion to the admittedly fairly low incidence of decubitus calculus, which, after all, most patients are not going to develop in any case.

Periodical microscopy of the urine should also be carried out, and if the urine is infected from the start, as it may be, a periodical radiological examination is well worth while.

If, despite all precautions, calculi commence to form, more active measures are indicated. In these cases, when the calculi are almost certainly still soft and friable, an attempt at their solution should be made by acidifying the urine, whether by drugs or diet. Here also stilbœstrol should

find a therapeutic function, increasing as it does the excretion of citric acid, reducing calcium excretion and increasing calcium solubility without altering the urinary pH. "Amphojel" also can be given with advantage to reduce, as it does, the urinary phosphate excretion. Here also, if anywhere, the technique used by Lins could be most valuable if it works as well as stated. I refer, of course, to the synthetic preparation which he administers to his patients rectally, and which he states produces the same effect on phosphatic incrustations as does the natural preparation, the buitach apple brew, when ingested by the more unfortunate bathers in the River Amazon, on the skeleton of that extraordinary and objectionable Candiru fish that always swims upstream.

## URATE CALCULI.

Bilateral calculi composed of uric acid or urates are encountered from time to time. If they are of any size diagnosis is usually quite straightforward. They are often referred to as transradiant, but are not entirely so, having a density approximately the same as that of soft tissues.

The first point I should like to stress in regard to these calculi is the fact that they are extremely prone to be bilateral. This has been the case with the last three such patients whom I have seen. It follows that one should be very chary of carrying out nephrectomy even though the condition may be apparently unilateral.

Secondly, the fact that they are not very radioopaque can render operation for multiple stones a matter of some difficulty, as it is extremely difficult to determine whether or not all the stones have been removed and X-ray examination is not of very much help. Here Dees's fibrinogen coagulum technique would appear to be most valuable.

These calculi can give rise to very difficult problems.

One patient, quite some time after bilateral operation had been carried out, developed right renal colic and became acutely ill and febrile. I thought I might well have to do a nephrostomy and later try to find a transradiant ureteric calculus, but fortunately his stone was impacted at the uretero-vesical junction, whence it was dislodged after some little difficulty.

If the stones have been completely removed, a diet reasonably low in purins and alkalinization of the urine should by all the rules help the patient to avoid future recurrence.

## PARENCHYMAL CALCULOSIS.

Parenchymal calculosis is a rare but interesting condition that shows up occasionally. Speaking from memory, I have seen two cases, one of my own and one of Mr. Laidley's. It apparently commences by proliferation of the tubular epithelium, which proceeds until the tubular lumen is completely occluded. The mass of cells then degenerates until a homogenous mass is formed, on which calcium salts are deposited. At one stage or another these masses may work their way into the pelvis, whence they may be passed.

One patient suffering from this condition has been followed for seven years, during the whole of which time the position of the stones in relation to the calyces and to each other has remained completely unaltered. Pyelography has been done, of course, and there is no question about the stones being in the parenchyma. Tuberculous infection and parathyreoid tumour have been excluded.

The patient is a healthy woman, at present aged thirty-four years. She has had occasional attacks of cystitis that have responded completely to sulphonamide therapy. Her renal function is normal. Two years ago one stone—the only one to date—worked its way into the right renal pelvis and was passed after a few attacks of colic. She was pregnant at this time, but pregnancy was otherwise quite uneventful and proceeded to a normal conclusion.

Treatment, of course, consists of maintaining an adequate fluid intake, and there is little else to do about it.

# CYSTS OF THE MESONEPHRIC TRACT.[1]

By E. R. Reay,
*Christchurch.*

The purpose of this article is to record two cases of cyst formations arising apparently in the Wolffian tract. The one at the hind end of the tract presented as a vaginal cyst and the other at the head end as a retroperitoneal tumour.

Vaginal cysts of considerable size are rare and often their origin is from vestigial remains. The study of their structure and ramifications is of interest from both clinical and developmental aspects. According to their mode of origin vaginal cysts may be grouped in three classes. The first and largest group comprises inclusion cysts. They arise from inclusion of patches of epithelial cells in the vaginal tissues in the healing of birth injuries or during surgical repair of the parts. They are small, are lined by several layers of squamous epithelium, and the contents consist of caseous breaking down cells. Seldom do they possess a definite capsule. Glands occur rarely in the vagina, and the second type of occlusion cyst is rare. Blockage of the mouth of a gland causes a small cyst lined by columnar or cuboidal epithelium and filled with clear mucus.

Cysts arising from vestigial remains form a more complex group. It has long been maintained by Keith that many tumours of the broad ligament region arise from remnants of the Wolffian duct, notably the epoophoron and the paroophoron. The Wolffian duct in the female, if it persists in its entirety, pursues a long and complicated course and comes into intimate relation with many organs. Gärtner's duct, the terminal paravaginal portion of the Wolffian duct, is the common site of cysts in this group. If the opening at the hymenal margin is blind or constricted, a prominent cyst may form in the superior or lateral vaginal wall. If the duct is patent there may be a profuse watery discharge of obscure origin. These cysts increase in size during pregnancy and may obstruct labour.

## Case Reports.

Case I.—Baby P. was admitted to hospital fifteen hours after a normal labour, with a history of being unable to pass urine. The child was a well-developed female in some distress. Above the pubes, extending to the umbilicus, the distended bladder could be felt. The urethra appeared normal in appearance and position. Immediately adjacent to the urethra and arising from the left antero-lateral wall of the vagina was a large bluish cyst. This extended well back into the vagina and protruded prominently when the child cried. There was no difficulty in passing a catheter and the retained urine was clear, and thereafter the child passed urine without difficulty. When the bladder was emptied there could be felt above the pubes a smaller and deeper swelling in the mid-line. On rectal examination the vaginal swelling could be felt to continue upwards to join a large cystic swelling filling the pelvic cavity. No opening could be found on the cyst surface. The diagnosis lay between a cyst of Gärtner's duct and ureterocele of an ectopic ureter.

It was decided to aspirate the cyst from its prominent vaginal aspect and determine its contents. Some 50 millilitres of turbid non-offensive fluid were withdrawn. The fluid contained some degenerate polymorphonuclear pus cells and numerous squamous epithelial cells. There were no organisms and no growth was obtained on incubation. As the cyst contents were sterile, 7·0 millilitres of "Uropac" were injected into the cyst cavity and radiographs taken in posterior and lateral planes. There was shown a large centrally placed cyst, the lower vaginal portion of which was sausage-shaped and the pelvic portion globular (see Figures I and II). The posterior wall

[1] Accepted for publication on December 23, 1947.

was in close proximity with the sacrum and lumbar spine, while the anterior margin approached the anterior abdominal wall. A cystogram showed in the posterior projection an enlarged and partly loculated bladder. The lateral projection showed the bladder pushed forward to the parietes (see Figures III and IV). There was no connexion by the cyst with the urinary tract and the contents of the sac were devoid of urinary constituents. Normal urination continued, the cyst was flaccid, and after a stay of two weeks in hospital the child was discharged, to return in three months. When seen at this later date the child had thrived, but the cyst had filled up again. Pressure on the abdominal swelling caused an obvious increase in size of the vaginal portion. After a few days in the ward retention of urine developed again and 250 millilitres of clear urine were withdrawn and 150 millilitres of fluid were aspirated from the vaginal portion of the cyst. Normal micturition was reestablished. The cyst

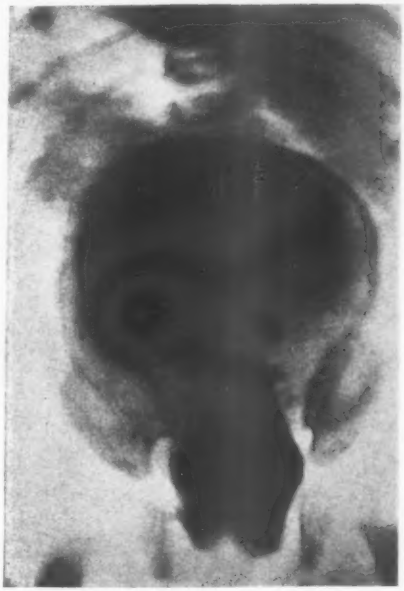

FIGURE I. Antero-posterior skiagram of the cyst filled with "Uropac".

FIGURE II. Lateral view of the cyst.

fluid showed profuse polymorphonuclear pus cells, but no organisms. The blood picture at this time revealed only a mild polymorphonuclear leucocytosis. It was decided that operation was not indicated in this small infant because of the lack of urgency and the probability of extensive attachment of the cyst to other organs. The prominent vaginal portion was incised and some six ounces of turbid greenish fluid were removed. Drainage was not used because of the risk of infecting the sac. A small piece of the cyst wall was taken for section. The wall consisted of fibrous tissue containing atrophic plain muscle fibres. The lining was transitional epithelium similar to that found in the urinary tract. The child was discharged and when seen again at the age of six months she was well and the cyst had not refilled. Nutrition was normal and the urine was sterile.

Retroperitoneal cysts are uncommon and obscure in origin. The term should be reserved for those cysts that lie in the postperitoneal fatty tissue and have no real connexion with any adult structure. Seldom do they have any regular vascular pedicle, but derive an irregular blood supply from surrounding tissues. Many of these cysts arise from developmental remains in the urogenital tract.

CASE II.—A man, fifty-six years of age, was admitted to hospital with a lump in the left side of the abdomen which he had discovered himself. There was no pain

or tenderness, but he had noticed the gradual increase in size of his abdomen. He had enjoyed good health except for mild bronchitis during the winter months over the past twenty years. Digestive, bowel and urinary functions had been undisturbed. Physical examination revealed a visible swelling in the left side of the abdomen. A large, smooth, rounded mass was felt to occupy the whole of the left side of the abdomen. Above, a rounded margin could be felt just below the costal margin, and below the mass extended to the pelvic brim. It appeared to fill the loin and moved with respiration, but could not be moved within the abdomen. It was dull to percussion and no band of colon resonance could be detected. There was no tenderness on palpation. The mass was firm and tense, but not hard, and suggested a large cystic tumour. There was no pulsation and no bruits could be heard over its surface. There was a large left varicocele but no œdema of the legs. Slight emphysema of the

FIGURE III. Antero-posterior cystogram—distortion of the bladder outline.

FIGURE IV. Oblique view of the cystogram—anterior displacement of the bladder.

chest was present with a few coarse rhonchi; the blood picture was normal except for a raised sedimentation rate, grade five. Blood urea and urea clearance values were normal. Tests for hydatid and syphilis gave negative results. A plain radiograph showed cloudiness over the large area occupied by the tumour. A barium enema showed lateral displacement and compression of the descending colon. An intravenous pyelogram revealed upward displacement of the left kidney and medial displacement of the ureter (see Figures V and VI). No dye appeared in the area occupied by the tumour. The pyelogram showed a normal pelvis and calyces and normal emptying of the dye. The mass appeared to be retroperitoneal, but not to have any connexion with the urinary tract. A renal cyst of this size would have been expected to produce some distortion of the inferior margin of the pyelogram.

Operative difficulties were apparent in the very large size of the tumour and the lateral displacement of the colon. Favourable signs were the good condition of the patient and the relative mobility of the mass. A preliminary transfusion of 500 millilitres of blood was given. Under continuous "Novocain" spinal anæsthesia the abdomen was opened by a paramedian incision. The mass was discovered filling the whole of the left side of the abdomen and extending below to the bifurcation of the left iliac artery. Above, the kidney was pushed up, but was unconnected with the tumour. Over the surface of the mass the mesocolon was stretched and adherent and the collapsed descending colon was on its lateral margin. Great difficulty was experienced in reflecting the colon medially. Attachment to the tumour was intimate and several tears were made in the mesocolon. One half of the tumour surface was exposed in a vertical plane and it was thought that to proceed further would endanger the blood supply of the colon. The exposed area of the tumour was packed off from the peritoneum and a large aspirating needle inserted. A thick red-brown fluid was

evacuated, the opening was enlarged, and by suction over three pints of this fluid were evacuated. The cyst was laid widely open. The wall consisted of a thick adventitia and a thinner, more cellular lining membrane, which in places could be easily detached. As it was impossible to proceed further with the separation of the adventitial covering it was decided to remove the lining cyst wall. This was accomplished readily in the upper region, but in the more distal parts of the cyst there were adhesions and free bleeding was encountered. Some strips of cyst wall were left adherent and the cavity was firmly packed. This did not control the oozing and it was finally arrested by use of the coagulating electrode. A tube drain was placed from the cavity into the loin and the incision in the capsular wall securely closed and the colon replaced. No

FIGURE V. Excretion pyelogram showing upward displacement of the left kidney after fifteen minutes.

drain was placed in the peritoneal cavity. Parenteral administration of fluids, including a further 500 millilitres of blood, was continued for the next forty-eight hours. The lumbar drain was removed on the fifth day and convalescence was uneventful.

The fluid content of the cyst showed moderate pus cells. Red blood cells and tissue debris were prominent. There were no organisms and no growth was obtained on incubation. The pathological report read as follows:

Macroscopic—the piece of tissue appears to be the lining of a cyst, the lining surface is smooth and partly ragged with small projections. Microscopic sections of the cyst wall show that it consists mainly of primitive kidney tissue. The glomeruli are scanty, primitive and show all stages of atrophy and degeneration. Some are completely fibrosed.

In Figure VII there is a well-formed glomerulus and to the left of it a series of atrophic tubules which have the appearance of convoluted tubules. Below the glomerulus there is a long tubule resembling a loop of Henle. Beneath the loop there is a packed mass of lymphoid inflammatory cells. In Figure VIII there is a degenerate glomerular capsule and scattered about it there are several atrophic convoluted tubules with degenerate cuboidal epithelium and in some a thickened basement membrane.

## DEVELOPMENT CONSIDERATIONS.

In early embryonic life after primitive segmental division there are excreting tubules in each segment. They arise as single offshoots from the cœlomic cavity and form the excreting organs of the related segment. They exist from the cephalic to the caudal division. Those proximal to the mid-

FIGURE VI. Excretion pyelogram at thirty minutes: the left ureter is displaced medially by an opaque mass directly below the left kidney.

thoracic region form the pronephros and those distal the mesonephros. A solid cord of cells arising in the head region unites these tubules and gains access to the cloaca. This cord becomes canalized to form the pronephric duct. The pronephros rapidly disappears and the duct comes into association with the larger and more persistent mesonephros (Wolffian body). It is now known as the Wolffian duct. Internal to the duct and in the intermediate cell mass another ridge appears on each side—the Müllerian duct—which is

an invagination of the cœlom into the mesoderm to form the genital fold. Thus on each side there are two vertical ridges, the internal genital fold containing the Müllerian duct and the external mesonephric fold with the Wolffian duct. Each has its own mesentery, but they have a common basal attachment. On the inner aspect of the genital fold the sex gland develops and it is important to remember the relations between the internal sex gland, the external Wolffian duct and the Müllerian duct between the two (see Figure IX).

Distally either from the hind end of the mesonephros (Keith) or from fresh cells in the intermediate cell mass the metanephros or permanent

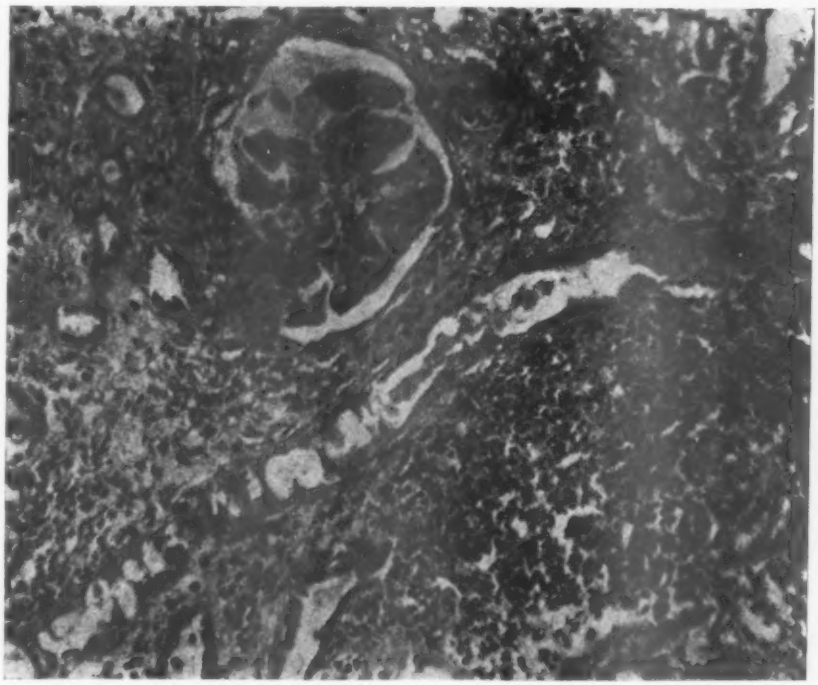

FIGURE VII. Section of the cyst wall.

kidney is forming. The first sign of this is seen in the 4·5-millimetre embryo (Pohlman). It is a dorsal outgrowth from the Wolffian duct just above the cloaca. This extends rapidly backwards to the second sacral segment to meet a cap of mesenchyma—the metanephros. At this stage the pelvic ends of the two genital folds fuse to form a common genital cord which also gains access to the cloaca. A wide divergence now occurs, depending on whether the embryo develops as male or female. In the female there is no further use for the mesonephric tubules and the Wolffian duct and they atrophy from loss of function. The genital part of the female mesonephros consists of twelve tubules, all of which become detached at the junction of secreting and collecting elements. They persist as the blindly ending ducts of the epoophoron and the paroophoron; the former is the homologue of the epididymis and the latter of the paradidymis. Keith regards the paroophoron

as an active structure continuing to grow and develop until the thirty-fifth year. In the male there are six genital tubules in the mesonephros. They become detached as above, enlarge and become convoluted and gain attachment to the *rete blastema testis*. Later they unite with the testicular tubules—the cephalic tubules become the efferent ducts of the testis and the caudal become the paradidymis and *ductus aberrans* (see Figure X).

### THE FATE OF THE WOLFFIAN DUCT IN THE FEMALE.

The primitive kidney begins to ascend from its original sacral position and in the 14-millimetre embryo has reached the fourth lumbar plane and is rotating in half a circle in a vertical plane. The kidney ascends behind the

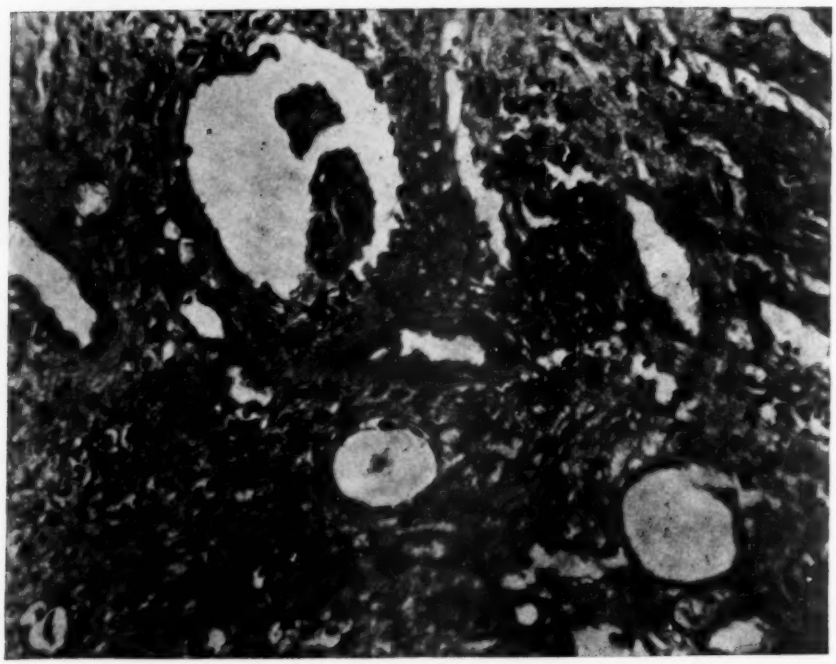

FIGURE VIII. Section of the cyst wall.

mesonephros and the ureter lies lateral to the Wolffian duct. In the 20-millimetre stage the ureter has gained a separate entrance into the urogenital sinus above the opening of its progenitor, the Wolffian duct. It is important to remember that the sex gland is the innermost structure of all. It has a fixed attachment to the inguinal region by the inguinal ligament, and when it begins its descent to this region it is swept into the mesentery of the nearest structure, the genital fold containing the Müllerian duct. They descend together, the mesentery of the duct becoming the mesosalpinx and the cephalic end of the duct forming the Fallopian tube. Also carried down in this mesentery is the Wolffian duct, the two ducts having a common basal mesentery. After birth the Wolffian duct appears as the horizontal duct of the epoophoron—a cord in the mesosalpinx below and parallel to the uterine tube. Sometimes in children, and rarely in adults, a further course

may be traced lateral to the cervix and vaginal wall to the hymenal margin, which margin represents the junction of the caudal fused Müllerian ducts and the vulvar cleft. The opening is usually in the superior margin of the vagina, but may lie within the urethral meatus. This paravaginal part is known as Gärtner's duct and, when persistent, may be patent or blindly ending. At the distal end of a patent Gärtner's duct is a sacculated expansion (the homologue of the vesicle) which may produce a watery vaginal discharge.

If the mesentery of the Wolffian duct was abnormally free and mobile, and if the pronephric end was unduly persistent and formed some permanent attachment, it would be possible for the distal part of the duct to be carried

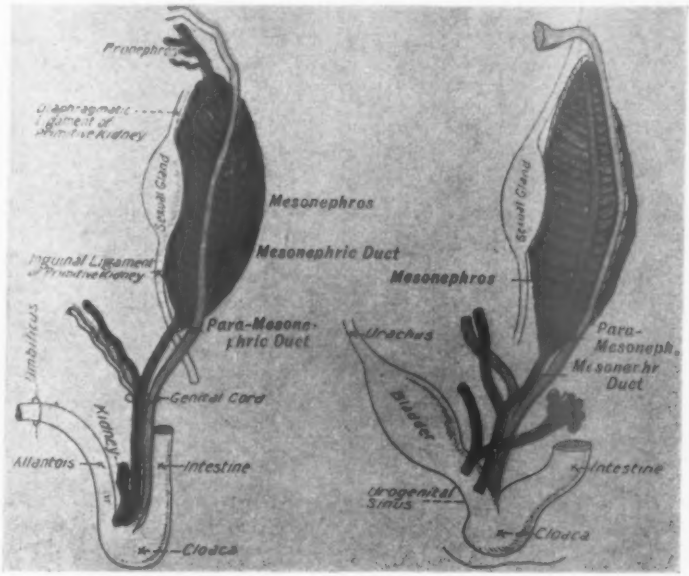


FIGURE IX. Development of the mesonephros. (After Fraser.)

down into the mesosalpinx and for a cephalic renal segment to be left. Again, if a considerable remnant of the duct was redundant beyond the broad ligament it might be carried upwards by the renal ascent. A Wolffian duct can persist patent from the region of the upper pole of the kidney to the vaginal opening. The Wolffian duct will be medial and ventral to the ureter with which it will be in close relation.

The fused lower ends of the Müllerian ducts (the genital cord) form the uterus and the vagina and throughout maintain their medial but close relation with the Wolffian duct. A rare anomaly may arise here to cause further confusion. The Müllerian ducts may fail to unite and duplicated uterine and vaginal canals may result. In one reported case there was a uterus and vagina on one side with a uterus and blindly ending vagina on the other causing a cystic swelling in the apparently normal vagina (see Figure XI).

## FATE OF THE WOLFFIAN DUCT IN THE MALE.

The duct loses its place in the excretory system, but gains an important place in the genital sphere. We have seen above how the genital mesonephric

tubules gain an attachment to the *rete testis* to become the *vasa efferentia*. As the tubules drain into the Wolffian duct this duct becomes drawn down in the descent of the testis to form the convoluted tube of the epididymis, the vas and the ejaculatory duct. The vesicle arises as a blind diverticulum from the caudal end of the Wolffian duct. In the male it is the Müllerian

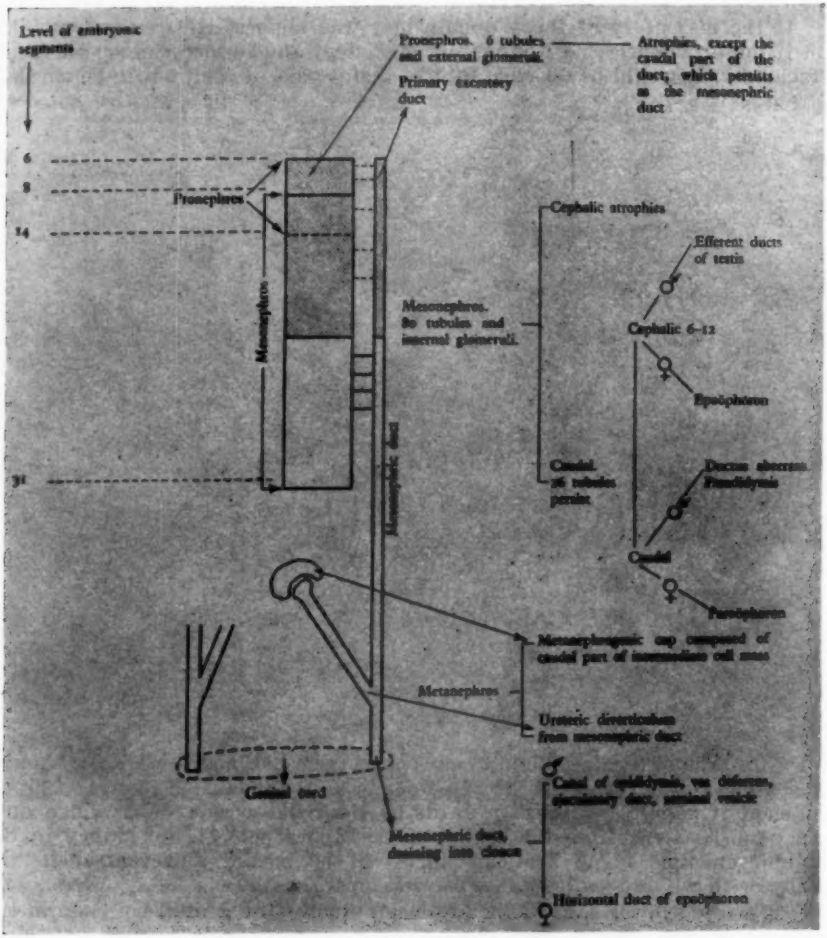


FIGURE X. Development of the human excretory system. (After Oakley.)

duct that gains no function. The two ducts fuse and the blind end grows down to reach Müller's tubercle and form the utricle in the prostatic urethra. Upward canalization of this cellular cord is very rare and as there is a sphincter below its opening, symptoms are not apparent and the diagnosis of a patent tract is difficult. In cases of hermaphroditism the uterus and vagina have opened into the prostatic urethra. There are a few reported post-mortem cases of undoubted Müllerian duct persistence. Retroperitoneal tubes were seen to pass from the renal region, medial to the ureter behind

the bladder to the posterior portion of the urethra. From a consideration of the above it can be seen that an intact male genital tract precludes the possibility of a Wolffian duct relic. A close examination of the second case would have made the diagnosis clear. On further inspection it was found that the left testicle was small and there was a moderate varicocele, but there was no epididymis or vas. On examination of the rectum there appeared to be a vesicle on each side, but urethroscopy was not done. It would be interesting to catheterize and inject the left ejaculatory duct if present.

### HISTOLOGY.

The primitive Wolffian duct is lined by a single layer of cubical epithelial cells separated by a basement membrane from a longitudinal coat of plain muscle. There is an outer coat of circular muscle fibres and the whole is encased by a sheath of vascular fibrous tissue (Duthie). It had been held that the typical lining of the tract was columnar and ciliated. Gärtner's duct shows great variations from cuboid to stratified squamous epithelium. In cysts of the duct wide variations may be seen in the epithelial lining of one cyst wall (Meyer). The muscular coats degenerate with age and are largely replaced by white fibrous tissue. The essential feature of the epithelium in any part of the tract which may persist is that it continues to grow and to differentiate. This explains the infrequency of malignant change in the cysts.

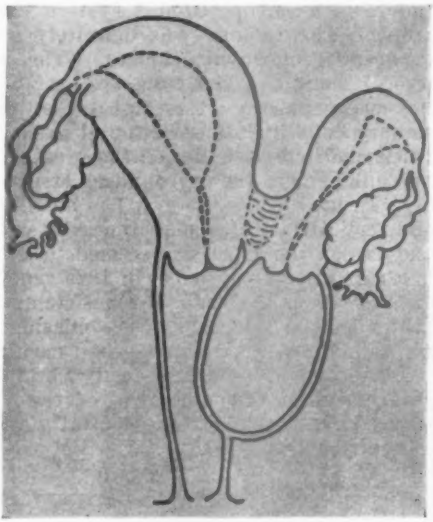

FIGURE XI. One type of vaginal cyst. One cervix opens into a fully developed vagina, the other opens into a blind vaginal cyst which bulges into the normal channel.

In the second case there was no epithelial lining to the cyst wall, it having probably disappeared from intracystic pressure. The striking feature of the histological picture was the primitive nature of the nephrons, their scattered and atrophic appearance.

### DISCUSSION.

In the baby with the vaginal cyst the location in the anterior lateral wall of the vagina and the continuation of the swelling into the pelvis suggested at first a swollen, blindly ending ectopic ureter. Delineation of the cyst by injection of an opaque medium showed it to have no connexion with the urinary tract. There were no urinary constituents in the contents and it did not secrete urine after incision. It had no connexion with the urethra. Histological section showed an epithelium common to both the urinary and lower Wolffian tracts. It was not an abnormality of the Müllerian tract nor yet a hydatid cyst. It seemed certainly to be a cyst of Gärtner's duct. The Wolffian duct was probably patent throughout the length of the broad ligament and the uterus and left Fallopian tube stretched over the pelvic part of the cyst. Excision of the cyst with its probably intimate attachment to the left ureter, the base of the bladder and the pelvic floor presented many problems. Surgical removal of a large vaginal cyst

from below without knowledge of its upper limits may lead to difficulty. This case shows the value of injection of an opaque fluid into the cyst cavity if the contents are uninfected. The upper limits and relations of the cyst were well shown.

The second case shows how easily the true nature of these mesonephric cysts may be missed. Because elements of nephrons are found in the cyst wall the condition is ascribed to some change in a supernumerary or abortive kidney. The mesonephros contains the primitive nephrons and if there is no transfer of its duct to the genital system it may persist, continue to secrete and form a retroperitoneal cyst in close relation with the kidney and the ureter. The tumour was definitely outside the renal capsule and had no apparent ureteric attachment. The appearance of primitive nephrons in several sections taken from the cyst wall would suggest that it is a cyst of the mesonephros. It occupied the primitive position of that organ. No urinary constituents were found in the contained fluid. The difference from other reported cases lies in the presence of a firm adventitious capsule which was adherent to the surrounding structures, and within which the actual cyst lay. In most cases the cyst has no covering beyond the posterior peritoneum and very little attachment to nearby structures. The absence of the epididymis and vas on the same side seemed to clinch the diagnosis. Absence of the vas is a rare anomaly. Demel in 1926 reported a series of twelve cases. In seven of these the epididymis, vas, vesicle and ejaculatory duct and the kidney and ureter of the same side were missing. Here obviously the whole Wolffian tract was absent. In the second case presented here the development of the ureteric bud proceeded normally, but the fault lay in the persistence of the attachment of the upper end of the Wolffian duct to the mesonephros and its non-transference to the genital gland. A more careful examination of the genital tract might have given the exact pre-operative diagnosis.

## ACKNOWLEDGEMENTS.

My thanks are due to Dr. A. B. Pearson for his help with the pathological material, to Dr. R. Neil Guthrie for the radiography, and to Mr. Walton Bremner, who performed the operation in the second case.

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# RUPTURE OF THE BICEPS BRACHII, WITH REPORT OF A CASE OF BILATERAL RUPTURE OF THE LONG TENDON.[1]

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*Wanganui.*

WE have come to associate the phenomenon of rupture with certain specific muscles in the body—for example, the *biceps brachii*, the *extensor longus pollicis* (after Colles's fracture), the *rectus femoris*, the quadriceps, the *rectus abdominis* (during parturition), the *tendo Achillis*, and the plantaris; less often the *extensor carpi radialis* and the *flexor longus pollicis*. The supraspinatus is also frequently ruptured.

When the less common accident of avulsion is included, the list also covers *triceps brachii* (associated with fractured olecranon), the *adductor magnus*, psoas, supraspinatus, biceps and quadriceps. Even the ischial tuberosity has been avulsed.

Our attention here is confined to traumatic rupture of the *biceps brachii*, an accident the frequency of which has been estimated by Stimson, of Chicago, as occurring in three out of 10,000 injuries examined. All of us have encountered cases of ruptured biceps, both recent and old; but it has not always occurred to us to operate for the repair of the condition, mainly because the loss of function is not sufficiently appreciated and the good results of operation are not realized.

FIGURE I. J.K.C. Bilateral rupture of long tendon of *biceps brachii*. The familiar egg-shaped lump which results from this accident.

## CASE REPORT.

J.K.C., a male, aged fifty-three years, a labourer, was admitted to hospital on December 5, 1946, with the following history. During the last three years he had been operated on for bilateral Dupuytren's contracture of the palmar fascia. Eight years ago he fractured the internal epicondyle of the left humerus and the ulnar nerve was transposed for neuritis. The lower end of the left radius had been fractured, with partial loss of supination of the forearm. In 1918 he received a gunshot wound behind the left knee joint.

*Rupture of the Left Biceps.*—On October 16, 1945, whilst lifting a log, he felt a sudden snap and ruptured his left biceps. This was treated by three weeks' physiotherapy and he returned to work. He maintains, however, that the power of the left arm was greatly reduced.

*Rupture of the Right Biceps.*—On December 4, 1946, he was lifting a heavy case when the long tendon of the right biceps suddenly gave way with a snap. On admission to hospital on December 5, 1946, there was found a recent rupture of the right biceps and an old-standing rupture of the left. The characteristic egg-shaped tumour of the biceps was present on both sides (Figure I).

[1] Accepted for publication on March 4, 1948.

*Operation.*—On December 6, 1946, operative repair of the recently torn right biceps tendon was carried out. The incision followed the anterior border of the deltoid, and the cephalic vein was retracted inwards, the bilaminar *pectoralis major* tendon being exposed. The long tendon of the biceps, as thick as the index finger, was picked up with forceps and easily drawn down until the severed end was secured. A gush of synovial fluid showed that the rupture had been an intraarticular one.

FIGURE II. Full flexion against resistance. Restoration of right biceps (long head). The incision is shown, and outlined on the skin is shown the manner in which the biceps tendon is looped through the pectoralis insertion. Contrast the operated-on right arm with the left, which has not been operated on.

The biceps tendon was now passed through the tendon of insertion of the *pectoralis major* towards its lower border, looped round and sutured through itself in the manner shown. The arm meantime was held in full flexion. After closure of the wound the arm was placed in a sling in full flexion for three weeks, after which passive movements were commenced, and by six weeks the full range at the elbow was present. Supervision and muscle exercises were continued up to twelve weeks, when full recovery and power were restored.

Similar results could not be promised with the left biceps, which was considerably wasted, the injury being eighteen months old; but at the patient's request the operation was undertaken on March 6, 1947, the same technique being used.

In this case the long tendon was found to be much reduced in size, being about the diameter of a lead pencil. It had formed adhesions to surrounding structures in its bed; but the greatly shortened muscle had little effective pull.

About three weeks after this operation, whilst the arm was still in the sling, the patient got into a "rough-and-tumble" and thought he felt something give way at the site of repair. The wound was immediately reopened and the fixation examined. It was found to be intact. A few additional sutures were inserted and the wound was closed. During the post-operative treatment this wasted biceps was considerably redeveloped, and the final results are seen in Figure IV in both arms, where the contours are again approaching the normal.

FIGURE III.

FIGURE IV.

This case raised the question of workers' compensation, which will be considered further at a later stage.

## SITES OF RUPTURE OF THE BICEPS.

The muscle may rupture in any of its parts or be avulsed from either end, as Table I, compiled from Gilcreest's[11] figures, will show.

## THE MECHANISM OF RUPTURE AND ITS FACTORS.

The muscle is supplied by the anterior circumflex and brachial arteries and is innervated on its deep surface by the musculo-cutaneous nerve. Congenital absence of the long muscular belly is common, but the long tendon is rarely absent.

The action at the shoulder is flexion and adduction. At the elbow it is "mid-supination" from the fully pronated position, followed by flexion. The lateral portion of the muscle is favourably placed for effecting supination.

Although intracapsular, the long tendon is extrasynovial. Its peculiar course over the head of the humerus exposes it to fraying and attrition where osteophytes exist at the articular margin. Grant[13] found this condition present in 16 out of 46 dissecting room specimens (35%) over the age of sixty years. Between the ages of fifty and sixty years the percentage was 17 affected, whilst under the age of fifty years none was affected in 16 specimens. From an insurance point of view an X-ray photograph would elucidate this point.

It is erroneous to suppose that loss of the long tendon will allow the humeral head to rise out of the glenoid socket. The coraco-acromial ligament prevents such upward travel. Nothing is, therefore, lost when the long head is transposed into the coracoid.

TABLE I.

*Sites of Rupture of the Biceps (102 Lesions).*[1]

| Point of Rupture. | Number of Cases. | Comments. | Totals. (Approximate Percentage.) |
|---|---|---|---|
| *The long head:* | | | |
| Avulsion from the glenoid cavity .. | 9 | | 65 |
| Intraarticular rupture .. .. .. | 34 | Bilateral cases .. 4 | |
| Extraarticular .. .. .. .. | 14 | Bilateral case .. 1 | |
| Muscular belly .. .. .. .. | 8 | Complete .. 3 | |
| | | Partial .. .. 5 | |
| *The short head:* | | | |
| Upper tendon of origin .. .. | 2 | | 26 |
| Upper musculo-tendinous junction .. | 20 | | |
| Muscular belly .. .. .. .. | 2 | Complete .. 1 | |
| | | Partial .. .. 1 | |
| Lower musculo-tendinous junction .. | 2 | | |
| *Both long and short heads* .. .. | 7 | Complete .. 6 | 7 |
| | | Partial .. .. 1 | |
| *Lower common tendon* .. .. .. | 4 | Avulsion .. 3 | 4 |
| | | Rupture .. .. 1 | |

[1] Indirect violence, 83; direct violence, 19; bilateral injuries, 5. All recorded cases are in males.

Experiments have been performed on the cadaver to test the tensile strength of the long tendon of the biceps. The tendon withstood a pull of from 150 to 200 pounds in the healthy subject.[3]

The pathological changes which may occur in the tendon or muscle (atrophy, calcification, myositis) are those of senile degeneration after the age of sixty years, consequent upon diminishing blood supply. Acute and chronic infections are rare, and only one case of rupture due to acute suppuration appears to have been recorded. No neoplastic affections of the biceps tendon have been reported, although such occur in the patellar ligament and the *tendo Achillis*. Standard textbooks of pathology give but little attention to this subject.

It would appear, therefore, that except in old people with arthritis and marginal osteophytes, rupture of the biceps tendon must be of traumatic origin, and this conclusion seems to be accepted in general by contributors to the British, American and European literature.

Most of the recorded cases occur in middle-aged men (forty to sixty years) who are manual workers with no history of antecedent disease. The mechanism of rupture is nearly always the same: flexion of the elbow against

powerful resistance (for example, lifting concrete blocks or logs, cranking a motor-car *et cetera*), the snap occurring when flexion has reached about 100°, that is, before the right angle has been reached. Sometimes the rupture is partial and the symptoms are then slight. The partial rupture is especially liable to be confused with other conditions, such as subacromial bursitis (a favourite), sprains, rupture of supraspinatus tendon, neuritis *et cetera*.

A series of partial ruptures, with repair in each case by scar, may occur ("subacute" type of Gilcreest). This author also describes a latent or senile form. But where the rupture is dramatic he attributes the cause to trauma *per se*.

## SIGNS AND SYMPTOMS.

The "typical syndrome" of traumatic rupture, based on this age-sex distribution, includes a sudden snap when lifting, usually with an acute pain, and always with loss of power. The essential function of the biceps is lost or greatly weakened, and the attempt to use the muscle causes pain. Ecchymosis is unusual, being more characteristic of a fracture of bone, but local swelling and synovial effusion occur. Most characteristic is the "egg-shaped tumour" caused by the disinserted muscle belly. If the rupture is above (for example, in the long tendon), the tumour is towards the elbow; if the rupture is below (for example, in the common tendon of insertion), the tumour is higher; whilst a tear in the belly of the muscle can be felt as a gap or depression. In each case a sulcus can be felt at the ruptured end and the loose tendon may at times be felt and rolled under the finger.

These signs are increased by attempts at muscular contraction, and this fact helps in the diagnosis from other conditions, such as a lipoma, subcutaneous or subfascial (see Table II).

TABLE II.

*Signs and Symptoms (Syndrome of Rupture).*

| Symptoms. | Signs. (Compare with the Unaffected Arm.) |
|---|---|
| Audible "snap" with variable pain, and constant weakness. | Egg-shaped tumour. (Note size, shape, elasticity.)<br>Hiatus (above or below, as the case may be).<br>Palpation of tendon (slack and rolling).<br>Loss of biceps function, whilst shoulder abduction is retained. (Exclude deltoid and supraspinatus lesions.)<br>Absence of tenderness and swelling over the upper deltoid, and the supraspinatus bursa. |

## TREATMENT.

There is a fairly general agreement on the subject of treatment. Conservative measures (rest and physiotherapy) are indicated when rupture is only partial or of long standing, when the patient is old and no longer needs to do heavy work, or when an acute infection is present.

Early operation (within a few days) is recommended in all other cases of traumatic rupture. Even in a case of fairly long-standing rupture it is possible after repair to recover much of the lost muscle power by physiotherapy. The patient whose case I have described considered that the rupture deprived him of 50% of the power of flexion at the elbow. This point may be appreciated in the gymnasium when "pulling up" on the horizontal bar, when the tension and power of the biceps tendon are very evident.

In the table on treatment which follows (Table III) I have set out the views and results of twelve writers on this subject. It is probable that operation may be employed more frequently by those surgeons who care to peruse this table.

TABLE III.

*Treatment. (Twelve Authors.)*

| Author. | Number of Cases Analysed. | Site of Rupture. | Morbid Anatomy. | Treatment Adopted. | Results. | |
|---|---|---|---|---|---|---|
| | | | | | Operation. | No Operation. |
| Gilcreest[1] .. | 100 (106 lesions) | See Table I: Long head, short head, musculo-tendinous junction, whole belly, lower tendon. | All cases: Trauma (percentage of antecedent disease not stated). | Immediate operation for long tendon, muscle belly or junction, and lower tendon. | Good results. (No statistical evaluation.) | Partial ruptures, "good recovery"; complete ruptures, "permanent weakness and wasting". |
| Stimson[2] .. | 3 | Long head (2). Whole belly (1). | Indirect trauma. | Operative repair. | Full recovery. | |
| Leavitt and Clements[3] | 1 | Lower tendon avulsion. | Direct trauma. | Operative repair. | Full recovery. | |
| Sharpe[4] .. | 1 | Lower tendon avulsion. | Indirect trauma. | Operative repair. | Full recovery. | |
| Brockman[5] .. | 1 | Long head at musculo-tendinous junction. | Trauma. | Conservative. | | "Little disability." |
| Cotton and Morrison[6] | 1 | Long tendon in bicipital groove. | Indirect trauma. | Operative repair. | Recovery with some slackness from too early return to work. | |
| Conway[7] .. | 1 | Long tendon, extra-articular. | Friction and slight trauma. | Operative repair. | Full recovery. | |
| Bauman[8] .. | 1 | Lower tendon disinsertion. | Indirect trauma. | Operative repair. | Full recovery. | |
| Verster[9] .. .. | 1 | Long tendon bilateral. | Indirect trauma. | Conservative. | | Able to continue work which was not heavy. |
| Rankin[10] .. | 4 | Long tendon (4). Extraarticular (1). Intraarticular (1). Not determined (2). | Indirect trauma. | Operation (2). Conservative (2). | Full recovery (2). | 75% recovery (1). Recovery after 5 years (1). |
| Bjorkroth[11] .. | 10 | Long tendon (6). Short head (2). Distal tendon (2). | Indirect trauma (9). Trauma *plus* degeneration (1). | Operation distal tendon (2). | Recovery (2). | Not stated (8). |
| Thomsen[12] .. | 1 | Distal tendon disinsertion. | Trauma. | Operative repair. | Recovery. | |

NOTE.—Indirect trauma arises from muscular action (lifting a weight, cranking a car *et cetera*). Direct trauma includes crushing, tearing, stab wounds, gunshot wounds, rope and winch injuries, severe falls *et cetera*.

### *The Type of Operation Employed.*

A glance at Table IV will convince many "pioneers" that they were not, after all, first in the field with their particular form of operation.

Nearly all of these methods have given good results. We are therefore able to select the operation most suited to the particular type of case, and a few standard procedures will suffice.

TABLE IV.

*Types of Operation Employed.*

| Author. | Operation.[1] |
|---|---|
| ***Rupture of Long Tendon:*** | |
| Rankin[10] | Suture end to end. |
| Gilcreest[1] | Overlap and suture. |
| Bazy, quoted by Gilcreest | Suture to the short head. |
| Perthes | Suture to the coracoid process. |
| Gilcreest[1] | *Suture to short head and coracoid process. |
| Stimson[2] | Suture to coraco-acromial ligament. |
| Bjorkroth[11] | Insert in tunnel under great tuberosity. |
| Roloff, quoted by Cotton and Morrison | Suture into bicipital sulcus |
| Conway[17] | Suture into bicipital sulcus |
| Renon and Calvez[23] | Suture into bicipital sulcus |
| Hofmann[24] | Suture into *pectoralis major*. |
| Christie | Suture into *pectoralis major*. |
| Cotton and Morrison[6] | Suture into deltoid. |
| ***Rupture of the Muscular Belly and Musculo-Tendinous Junction:*** | |
| Stimson[2] | *Suture the muscle and sheath with chromicized catgut. |
| Gilcreest[1] | Repair using *fascia lata* transplant. |
| ***Rupture of the Distal Tendon:*** | |
| Kirschner | *Reinsertion into radial tuberosity using a nail or screw. |
| Gilcreest[1] | Reinsertion with drill and suture, using chromicized catgut. |
| Rogers[14] | Reinsertion with drill and suture, using chromicized catgut. |
| Leavitt and Clements[3] | Ditto, using silk. |
| Thomsen[12] | Ditto, using wire. |
| Waugh[22] | Ditto, using fascial strips. |
| Bauman[5] | Refix with chromicized sutures tied over an external pad. |
| Platt[13] | Drill a large hole in radial tuberosity and set the tendon in. |
| Sonneschein | Insert tendon under a "radial trapdoor". |
| Gilcreest | Suture to soft structures, for example antecubital or bicipital fascia. |
| Donkans and Kelly | Suture to soft structures, for example antecubital or bicipital fascia. |
| Sharpe[4] | Suture to brachialis insertion. |

[1] The most practical and effective methods are indicated with an asterisk.

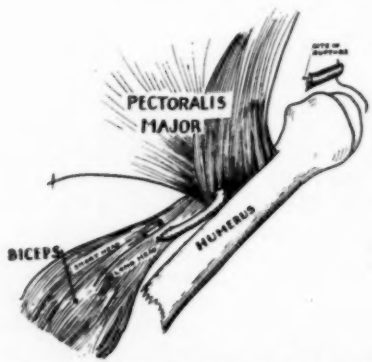


FIGURE V. Repair by the author's method.

The determining factor is the site of rupture. If the long tendon is broken high up in the arm, suture to the short head and coracoid process is possible and satisfactory. Where the broken tendon remains in its groove it must be pulled down to confirm the rupture. In other cases it will be found looped or coiled on itself. It is immaterial what sutures are used; but medium silk is strong and durable. A fairly long incision (five inches) is desirable.

If the rupture is lower down in the tendon, it will now be too short to reach the coracoid process and should be looped through the insertion of the *pectoralis major* or the deltoid (Figure V). This makes a powerful and short origin which is unlikely to give way.

Repair of the lower common tendon requires a more difficult dissection in the antecubital fossa and the tendon is reinserted with vitallium screw or

suture. Flexion of the elbow during the dissection renders retraction and exposure much more easy; and a generous incision is required (see Figure VI).

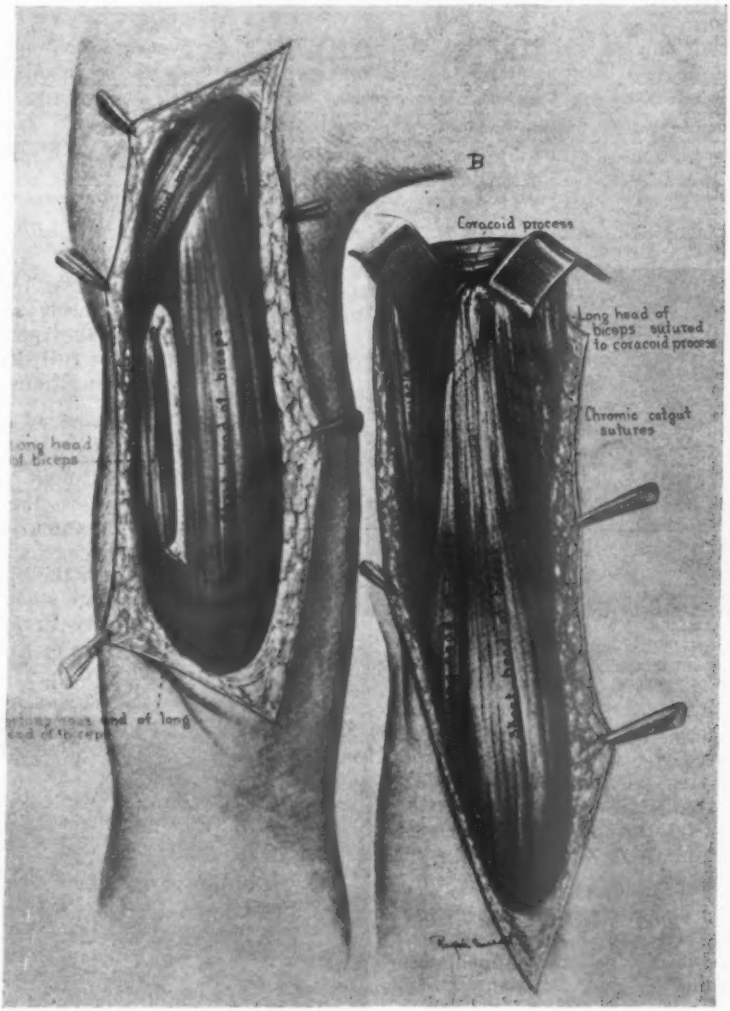


FIGURE VI. Repair by suture to coracoid and short head. (After Gilcreest. By courtesy of *Surgery, Gynecology and Obstetrics.*)

## POST-OPERATIVE TREATMENT.

Table V shows typical details given by some authors and the following routine may be taken as satisfactory.

| | |
|---|---|
| The first three weeks after operation .. .. | Immobilization in full flexion. |
| Fourth and fifth weeks .. .. .. .. .. .. | Passive and assisted movements. |
| Sixth, seventh and eighth weeks .. .. .. | Active movements. |
| Eight to twelve weeks .. .. .. .. .. .. | Return to work. |

TABLE V.
*Post-Operative Treatment.*

| Author. | Site of Rupture. | Post-Operative Treatment. | Total Period of Disability. |
|---|---|---|---|
| Stimson[2] .. .. | Long tendon, or muscle belly. | 3 weeks sling in full flexion.<br>2 weeks passive movements.<br>3 weeks active movements. | 8 weeks. |
| Cotton and Morrison[6] | Long tendon. | Similar. | 6 weeks. |
| Rankin[10] .. .. | Long tendon. | Similar. | 8 weeks. |
| Bauman[5] .. .. | Distal tendon. | 5 weeks plaster in full flexion.<br>2 weeks mobilization. | 7 weeks. |
| Sharpe[4] .. .. | Distal tendon. | 2 to 6 weeks sling in full flexion.<br>6 weeks mobilization. | 8 to 12 weeks. |

FIGURE VII. Rupture of common tendon of insertion of right biceps. (After Gilcreest. By courtesy of *Surgery, Gynecology and Obstetrics.*)

## THE MEDICO-LEGAL ASPECT.

From what has been said it appears evident that the insurance company should accept full liability under the following conditions:

1. In all clear cases of direct trauma.

2. In indirect trauma (muscular violence): (*a*) of the long tendon—the sudden traumatic rupture in men of middle age who are free from osteophytes of the humeral head; (*b*) rupture of the short head and the muscular belly in healthy individuals; (*c*) rupture or avulsion of the tendon of insertion.

Where antecedent local disease is proved to exist (for example, osteophytes demonstrated by X rays) the degree of compensation can be determined only after consideration of all the factors in the individual case.

The disability in all these cases can be removed in from eight to twelve weeks by the appropriate operation.

FIGURE VIII. Subfascial lipoma. (After Gilcreest. By courtesy of *Surgery, Gynecology and Obstetrics.*)

## SUMMARY.

1. A case of bilateral rupture of the long tendon of the *biceps brachii* is reported. The bilateral rupture is an unusual injury and only about eight cases have been reported.

2. The literature referring to biceps injury has been reviewed and the information so obtained tabulated for handy reference.

3. The indications for operation are discussed and the types of operation available pointed out.

4. The value of operative repair, even in a comparatively late case, is shown.

5. The medico-legal aspect of the injury is discussed.

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## Surgical Technique.

# A SPRING GOITRE RETRACTOR.[1]

By CHARLES GALE,
*Geelong, Victoria.*

IT is desirable that a self-retaining goitre retractor be so shaped that it lies comfortably in position and does not impede the manœuvres of the surgeon or his assistant. Some retractors do not directly interfere with the surgeon, but do so by hampering the assistant, commonly either by hindering the full depression of the handles of artery forceps which is necessary to allow the surgeon to apply ties readily or by interfering

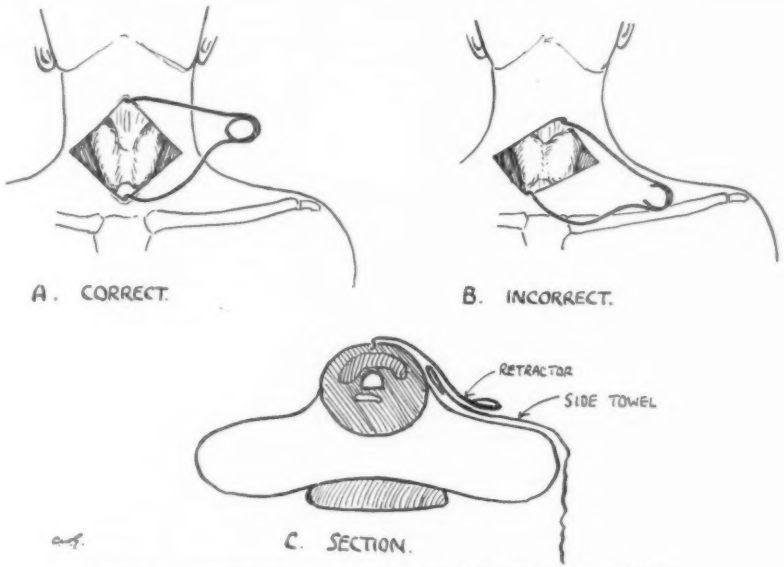


FIGURE I. Illustrating the retractor and its mode of application.

with the direction of application of hand retractors to allow approach to the various portions of the gland, particularly the upper pole.

The spring wire retractor illustrated[2] is so shaped that when correctly applied its curves correspond to those of the patient's neck and adjacent side towels (Figure I, C). The arms are of unequal length, so that the outer portion of the retractor lies well cranial to the patient's clavicle and left shoulder, and well back in contact with the side towel (Figure I, A, and C). The arms are so curved that the upper arm lies well above the point to which a hand retractor may be applied in the approach to the upper pole, the lower arm allowing similar ease of retraction to expose the lower pole.

Because of the inequality in length of the arms, the retractor is to be used only on the patient's left and cannot be correctly applied as is the usual spring retractor, that is, by placing it in position with the jaws held almost closed. Its shape is such that the surgeon's approach to the left half of the gland is not interfered with by the retractor being on the patient's left.

[1] Accepted for publication on December 9, 1947.
[2] Obtainable from Felton, Grimwade and Duerdins Proprietary Limited, Alfred Place, Melbourne, C.1.

The retractor is applied with the arms only half closed. The concavity of the point of the lower arm is applied to the skin edge of the lower margin of the incision and in the mid-line. The skin edge of the upper margin of the incision is elevated with toothed dissecting forceps and the point of the upper arm is similarly applied in the mid-line. The compression of the spring is then gently relaxed (Figure I, A).

The instinctive tendency to apply the retractor with arms almost completely closed must be resisted, as it results in retraction at points away from the mid-line, with consequent impingement of the retractor on the clavicle and shoulder (Figure I, B).

# A POINT IN THE TECHNIQUE OF PULMONARY LOBECTOMY.[1]

By DOUGLAS ROBB,
*Auckland.*

THE smaller the pedicle of a lobe to be removed when it is first seen—through the interlobar fissures being deep and free from adhesions and from enlarged glands around it—the easier is the operation likely to be.

In the cases to be described these factors were unfavourable, yet the operations proved to be precise at all stages, though naturally taking longer to carry out than "easy" ones.

The point lies in the application, to the whole of the left lower lobe, of the methods (somewhat modified) described recently by Clagett and Deterling and by Overholt and Langer for the segmental resection of the lingula and other special segments. The ease and relative bloodlessness of the separation where no fissure could be seen were most gratifying when compared with the inelegant procedures formerly necessary with the use of clamps and sutures.

### Case Reports.

CASE I.—Miss M.McW., aged nineteen years, pupil nurse, had marked bronchiectasis limited to the lower lobe of the left lung and the lower of the two main divisions of the bronchus to the lingula. The apical segment of the lower lobe was not so badly affected as the basal segments, but it was decided to resect the whole of the lower lobe and the lingula.

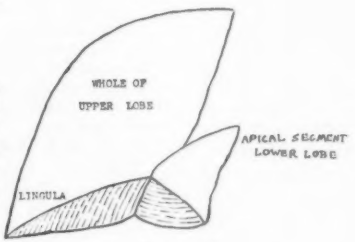


FIGURE I.

On thoracotomy there were moderate adhesions in the region of the *ligamentum latum*. The interlobar fissure was evident in only the upper and posterior third of its length, and even that part was shallow, varying from one-third to one-half of its expected depth. A chain of enlarged glands lay posteriorly to the hilum of the lower lobe. The remainder of the fissure seemed to be developmentally absent rather than obliterated by adhesions.

Dissection was begun from below by dividing the *ligamentum latum* and next the two lower pulmonary veins. Dissection being continued posteriorly between hilum and glands, the bronchi were next identified—the apical of the lower lobe first and then the main bronchus to the lower lobe—and were divided separately. The pulmonary artery then came into view and the superior branch to the apical segment was divided, followed by the main trunk to the lower lobe. By this time the hilar region was well opened up and the lines for the incision of the visceral pleura forwards over the non-existent fissure were obvious. The simplest part of all was the separation of the apposed surfaces of the lower lobe and lingula. Very little more than finger dissection was required and only brief oozing followed. A few points required ligatures.

Through a thin layer of lung tissue on the raw surface of the lingula the bronchiectatic lower branch could be seen. Its origin with its normal fellow from the main lingular bronchus was displayed, and the offending member was removed with an adjacent strip of lung tissue. The pleural edges were united by interrupted cotton stitches and the raw surface was thus buried.

Some trouble in maintaining inflation of the upper lobe was experienced, bronchoscopy on the second day and later aspiration of the pleural space being necessary, but convalescence was not delayed and a clinical cure resulted.

CASE II.—Mr. C.K., aged twenty-two years, a naval stoker, had bronchiectasis in the three lower segments of the left lower lobe, the apical segment and lingula being free. Removal of these three segments alone was planned.

There were dense troublesome adhesions to the chest wall, diaphragm and pericardium. The interlobar fissure was visible in its upper third only and was shallow.

[1] Accepted for publication on November 20, 1947.

Dissection was begun below the hilum and the pulmonary vein was secured, the tributary from the apical segment being left intact. Under this tributary, with some difficulty, the bronchus was found and divided, survival and patency of the branch to the apical segment being shown by inflation. By pulling the distal cut end of the bronchus forwards, the pulmonary artery was displayed; it was divided below a branch going into the apical segment. Separation of the affected segments was first carried out from the apical segment, inflation helping by giving the line of demarcation on the pleura. Then the plane between the affected segments and the remainder of the upper lobe (the "missing" part of the usual fissure) was similarly sought by blunt finger dissection. Both these separations appeared crude in the process, but were relatively avascular. When separation was completed, two definite flat surfaces of raw lung tissue were seen (see diagram). Both lingula and apical segment were well supplied with blood and inflated on raising of the pressure. The raw surfaces were not covered. The post-operative course with penicillin was uneventful.

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### Addendum.

Since completion of this note an opportunity of applying the "point" to the right middle has occurred. The case was one of a large teratoma of the anterior mediastinum invading and partially destroying the right middle lobe, so that it had to be removed with the main growth. The main fissure was deep and well defined, but the lesser was represented only by a short shallow cleft adjacent to the main fissure. Dissection was begun below the hilum of the middle lobe in the main fissure, and bronchus and vessels were secured. The remainder—demarcation of the avascular plane between middle and upper lobes, and lines for division of pleura—was easy, inflation and the blunt dissection with finger and swab being used as described.

## Case Reports.

# MASSIVE HÆMORRHAGE PER RECTUM DUE TO DISEASE IN A MECKEL'S DIVERTICULUM: REPORT OF CASE.[1]

By Oswald J. Ellis,
*Newcastle, New South Wales.*

Massive hæmorrhage *per rectum* due to disease in a Meckel's diverticulum was surveyed by J. T. Chesterman in 1935.[1] The bibliography up to that date is given and he reports four additional cases occurring at Sheffield Royal Hospital. A later survey by Lund in 1945[2] is summarized by Arthur E. Brown in The Australian and New Zealand Journal of Surgery.[3] At that date, according to Lund, there had been 136 published cases and a pre-operative diagnosis was correctly made in 33. The literature of Meckel's diverticulum is reviewed in 1947 from a general point of view by Josef J. Haber,[4] who records 23 cases occurring at the Charleston General Hospital. The majority of these cases were symptomless, and he comes to the conclusion that the commonest pathological changes resulting from Meckel's diverticulum are of the obstructive type. Ulceration is not recorded as being present in any of these cases. I have been able to trace four further cases of hæmorrhage from a peptic ulcer in a Meckel's diverticulum in the more recent literature.[5][6][7][8] Two further articles[9][10] were not available.

The presence of aberrant gastric mucosa in the diverticulum appears to be an almost constant feature in these cases of ulceration, though in the case reported by Patterson[6] there were only inflammatory changes and no gastric mucosa was present. Aberrant gastric mucosa is said to be present in 15% to 20% of cases of Meckel's diverticulum. Profuse rectal hæmorrhage of obscure origin should always cause the possibility of this condition to be borne in mind. Owing to the small number of cases reported in the literature, and particularly the small number of cases in which a correct pre-operative diagnosis was made, it appears worth while to record the following case.

### Clinical History.

The patient was a female, aged eighteen years and seven months, single. Her occupation was that of a bank clerk. She was admitted to Mater Misericordiæ Hospital, Waratah, on September 22, 1944, at 9.40 p.m.

The history was that on September 19 she was attending the pictures, about two and a half hours after her last meal, when she felt nauseated and inclined to vomit. There was no abdominal pain. She went outside and fainted, falling down a flight of about twelve stairs. She was assisted and lifted up and then fell down a second flight. At this stage she started to bleed *per rectum* and fainted again. She was carried into the office and placed in a lying-down position and a doctor was summoned. There was profuse hæmorrhage from the rectum, her clothes being saturated with blood and a pool forming on the floor. She was then taken home by motor-car and received medical attention, remaining in bed. On the two following days, September 20 and 21, her bowels moved twice daily, there being a small amount of bright blood with each motion. On the night of September 21 she was given one ounce of castor oil. Her bowels operated during the night, there being a normal motion with just a small amount of blood. During the day of September 22 there were two further motions, each with a small amount of bright blood. At about 6·45 p.m. that night she went to stool and felt faint and nauseated, but did not actually vomit. There was a sudden gush of bright blood *per rectum*, which half filled the chamber and also formed a pool on the carpet. She then collapsed and medical aid was summoned, and she was transferred to hospital. On admission she was pale and shocked, her temperature was 97·8° F., her pulse rate was 104, and her respiratory rate 26 in the minute.

The patient states that she had always been anæmic since early childhood and had periodic treatment for this. From the age of ten years onwards she had a number of attacks of abdominal pain which were thought to be due to appendicitis. She also

[1] Accepted for publication on November 20, 1947.

had bilious attacks at long intervals, which appeared to be controlled by diet. Twice during 1943 and once in 1944 she consulted a doctor for vague attacks of discomfort in the lower part of the abdomen on the right side, which were thought to be probable attacks of appendicitis.

She was seen by me the day after her admission to hospital, when her general condition had improved slightly. Abdominal examination revealed no abnormality, there being no tenderness and no localizing signs. On September 24 a blood count was as follows: red blood cells per cubic millimetre, 3,000,000; hæmoglobin value, 48%; colour index, 0·8. On September 25 a blood transfusion of 1,000 cubic centimetres was given. The blood count on September 27 was as follows: red blood cells per cubic millimetre, 3,000,000; hæmoglobin value, 50%; colour index, 0·83; leucocytes per cubic millimetre, 5,000. On the same day a small enema was given. There was a lot of old dark blood in the motion with only a small amount of bright red blood. On October 1 there was still some old dark blood present in the stools. On October 2 a proctoscopic and sigmoidoscopic examination was carried out. The rectum was normal, there being no hæmorrhoids present. The sigmoid was normal, but there was a small amount of bright blood seen at the apex of the sigmoidoscope. A provisional diagnosis of ulceration in a Meckel's diverticulum was made, but it was decided to try to exclude other possibilities before operation. On October 6 examination of the stools by the pathologist was reported on as showing: "No ova or parasites detected. Microscopic blood but no macroscopic blood present." On October 11 a barium meal examination was carried out and reported on as follows: "No organic lesion of stomach or duodenum detected." On October 13 a twenty-four hour barium meal was further reported on as follows: "No evidence of a Meckel's diverticulum. Appendix partly retrocaecal and bound down, but does not show any present signs of inflammatory trouble."

On October 19 a blood count was as follows: red blood cells per cubic millimetre, 4,650,000; hæmoglobin value, 70%; colour index, 0·77; leucocytes per cubic millimetre, 5,000. A positive diagnosis of ulceration in a Meckel's diverticulum was made and it was decided to carry out a laparotomy.

At operation on October 23 a Meckel's diverticulum was found situated about two and a half feet from the ileo-caecal junction. It was about four to five inches long, its lumen at the base being about the same size as that of the ileum. The apex was attached to the right of the umbilicus with the lumen of the diverticulum extending practically all the way to the umbilicus. There were two well-marked vessels on the peritoneal surface of the proximal half of the diverticulum. The diverticulum was removed and as the appendix was bound down with adhesions an appendicectomy was also carried out. The patient made an uneventful recovery and has had no further trouble since.

### Pathological Report.

A report of Dr. Ethel Byrne, pathologist, is as follows:

> Specimen removed at operation, Meckel's diverticulum. Macroscopically there is a healed ulcer the size of a threepence, the base covered with sloughy blood-stained material.
>
> Sections show typical gastric mucosa, with scattered inflammatory cell foci, and numerous blood vessels containing blood cells.

### Summary.

A case of severe hæmorrhage *per rectum* due to ulceration in a Meckel's diverticulum is reported. The presence of the typical aberrant gastric mucosa in the diverticulum was demonstrated microscopically.

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# A CASE OF VOLVULUS OF THE ENTIRE SMALL GUT, CAUSING DUODENAL OBSTRUCTION.[1]

By ROLLAND O'REGAN,
*Wellington.*

COMPLETE VOLVULUS of the entire small gut, though well recognized, is not common. In over half the cases the condition occurs in new-born infants or in patients whose symptoms have dated from a few days after birth. The patient may have recurrent attacks with freedom from symptoms intervening, but with marked effect on general growth and development.

According to Gardner and Hart in their important article on the subject, complete volvulus of the small gut is "the commonest cause of intestinal obstruction secondary to anomalies of intestinal rotation".

FIGURE I. Skiagram taken fifteen minutes after the passage of lipiodol (15·0 millilitres) down catheter into stomach.

Two types of the condition of total volvulus are described:

(*a*) Cases in which the torsion is tight and obstructs both the entering and emerging loops of gut. The arterial supply is cut off and the entire intestine becomes greatly distended and finally gangrenous. This type presents all the classical features of acute intestinal obstruction.

(*b*) Cases in which the torsion is less tight and in which the right colon is free on its mesentery owing to a failure of fixation. Here the third part of the duodenum is completely occluded at the point where it winds round the mesenteric root, but obstruction of the emergent loop is incomplete, and though the venous circulation is obstructed, the arterial circulation is not. The bowel as seen at operation shows marked venous congestion, but is quite collapsed and the case presents clinically all the features of duodenal occlusion. It is in this latter group that recurrent attacks of vomiting and pain may occur, extending over years, and patients in this group may have the first obstructive attack in adult life. Over half, however, have the first attack in the first few hours or days of life. It is to this group the case here reported belongs.

### Clinical History.

Baby M., a female, was born at 1.20 a.m. on June 1, 1946. She was a second child. Delivery was normal and the birth weight was seven pounds six ounces. Meconium was passed on the first and second day, and on the third day the motions were changing colour. Vomiting began on the morning of the second day and occurred a good half-hour after every feed. The vomitus at first just spilled out, but on the

[1] Accepted for publication on February 4, 1948.

FIGURE II. Showing the condition of volvulus of the entire small gut found at operation. Note that the large gut has been laid back in its normal position.

third day was frankly projectile. All vomitus was dark with bile. There was no evidence of pain, but when feeding the child would cease to suck, appear distressed and then resume. Urine was passed normally. A tentative diagnosis of duodenal atresia was made and the child was transferred from the obstetric hospital to Wellington Hospital.

Notes made on the child's admission read as follows:

> Weight seven pounds three ounces, colour good, nutrition fair. Vomiting of projectile type at frequent intervals. Between vomits the child rests peacefully and does not appear to have pain. Vomitus green with bile. Tongue moist. Fontanelle slightly depressed. No visible peristalsis or abdominal tumour observed. Hæmoglobin 70%. Blood group 0.

A catheter was passed down the œsophagus, the stomach was washed out, and a plain skiagram of the stomach was taken. Then 15 cubic centimetres of lipiodol were introduced into the stomach and further skiagrams were taken at intervals (Figure I).

The radiologist's report reads:

> In the plain film there is air and fluid in the stomach but no other bowel shadows are seen. Fifteen minutes after the introduction of the lipiodol the opaque medium has not left the stomach.

The baby was clearly suffering from duodenal obstruction at some point below the entry of the bile ducts, yet meconium had been passed freely and the child was not markedly dehydrated. A diagnosis was accordingly made of incomplete duodenal occlusion, due probably to congenital duodenal atresia. It was decided to operate.

FIGURE III.

*Operation.*—Two ounces of half-normal saline solution were given by subcutaneous injection at half-hourly intervals for three hours. Spinal anæsthesia was induced (two-thirds of a cubic centimetre of "Nupercaine"). The infant was secured to a padded "crucifix". The limbs were swaddled with gamgee tissue. The abdomen was opened through a right paramedian incision just ninety hours after birth.

A volvulus of the entire small gut was found to be present. To demonstrate it, the whole of the small intestine had to be delivered outside the abdomen. The gut was extremely congested and quite collapsed. It resembled nothing more than a large purple chrysanthemum. There was a clockwise twist of the narrow mesenteric pedicle through 360°. The right colon was quite unfixed (Figure II). The twist was undone. The right-hand aspect of the mesentery of the ascending colon was scarified with gauze and laid against the posterior abdominal wall in normal position and the abdomen was closed.

*Progress.*—The infant stood the operation well. Feeding was commenced immediately and carried on according to a feeding plan used for patients with pyloric stenosis following operation. The child was kept lying on the right side for some weeks with the idea of encouraging fixation of the right colon in its normal position. The wound healed cleanly and in the weeks that followed a gain in weight of eight ounces a week was recorded regularly. There have been no subsequent obstructive attacks.

Figure III shows the development and nutrition at fifteen months.

### Comment.

This case is a classical example of volvulus of the small intestine of the second group described above. Diagnosis was inexact because at the time I did not know that such a volvulus could present clinically all the features of a duodenal occlusion, pure and simple. On reflection I think that a caecostomy should have been done to fix the caecum in the right iliac fossa. This would appear to be the surest way to secure this end and so to prevent recurrence of the condition.

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# FELLOWSHIP OF THE ROYAL AUSTRALASIAN COLLEGE OF SURGEONS.

WHEN the Royal Australasian College of Surgeons was founded it had two advantages: it came into being when those principles which governed the practice of surgery had been crystallized by the advanced thought of an era of general progress; and since it was the most recently founded, it was able to profit by the accumulated experiences of the older colleges. It was therefore in a position to lay down principles of theory and practice which would ensure that those who became Fellows of the College would be educated to practise the best that the surgery of the day had to offer.

As the College took form it became obvious that there were two points of view in regard to the principles which should govern the institution of a Fellowship intended to serve as a standard of competency in surgery. Adherents of the English tradition held that the foundations on which to practise surgery were best laid by a Fellowship similar to that of the College of Surgeons of England. The "practical surgery" school, represented mostly by the New South Wales founders, felt that a diploma such as this would not exact those standards in actual surgical practice which were essential in those who would follow a calling carrying vital responsibilities. The founders, however, had to be realistic and to recognize that it was not possible at that stage to make a standard surgical degree a requirement, because some of the surgeons on the teaching hospitals at that time had no higher surgical degree and would not therefore be eligible for Fellowship. Thus the founders, as much from the force of circumstances as from any other consideration, had, for the time being, to turn to a method of entrance examination which

was a test in the practice of surgery, and accordingly they made the basis of this test a record of operations actually performed by the candidate (a practice in the American College). But at the same time they decided that it would be a constitutional principle that after a formative period of five years, when they hoped all recognized surgeons should have come into the College, a senior surgical degree should be an essential requirement of Fellowship.

When, however, experiences gained in this formative period were reviewed and the incorporation of a senior surgical degree in the Fellowship came under consideration two things became obvious. The first was that senior degrees varied a great deal in their standard, and the second that the test in the practice of surgery by case records had not been very satisfactory. These two things had to be remedied. Some degree of uniformity in the senior degrees had to be obtained, and a better way had to be found of ensuring that the Fellow had the kind of knowledge in the actual practice of surgery which would permit of his being classed as a trustworthy surgeon. A degree of uniformity was eventually obtained in the Australasian senior surgical degrees; and common-sense measures were taken which ensured that Fellowship would come to be regarded as a quality in a surgeon synonymous with that of competence. These measures were rather happily modelled on those obtaining in the ancient guilds of London and the application of the old and well-tried apprenticeship system to the training of a surgeon (the thought was Alan Newton's, then Honorary Secretary of the College). Thus, in addition to the requirement of a senior surgical degree of a recognized standard, there came about (1932) a second and important requirement, an apprenticeship training in the practice of surgery under an approved surgical teacher and, a corollary of this, a round-table examination by a board of censors, when questions, specially framed to find out if the candidate had benefited by his apprenticeship training, were asked. From 1932 this was the form of entrance examination. To the graduate studying for a surgical career, the two years' association with a senior surgeon afforded him practical tuition, brought him under an influence for good in his future professional life and imparted the quality of trustworthiness to his Fellowship. To the hospital, as this apprenticeship system came more into use, it was soon seen that it served a function of particular importance. It provided a service between the honorary and resident staff and the advent of this keen-minded extra surgical personnel was that operating theatre efficiency, clinical ward work, the experience of the hospital resident, undergraduate education, and the good of the patient all benefited not only from service value of this additional staff, but also from the teaching that it demanded.

Although this form of Fellowship was regarded as wise surgical policy in other countries as well as in Australasia, it became obvious in recent years that there were reasons why the form of the entrance examination should be reviewed. In this somewhat composite examination there was some lack of unity; there could be a duplication of examination effort and sometimes some conflict of surgical thought. There had been important changes in the

practice of surgery, one of which was a decided swing towards specialization. And overseas travel and experience had become highly valued and bulked largely in the education of a surgeon. Thus to conform with progress and wisely to guide changes, the College felt that it should consolidate its entrance examination or, in other words, that it should keep the standard of its Fellowship abreast of advances in surgery. It was thought that the entrance examination should combine the principles underlying the traditional senior surgical degrees and those important features in regard to the practice of surgery in the existing entrance examination; and that this one examination should replace the present requirements for Fellowship, which practically involved two examinations—an examination for a senior surgical degree and the entrance examination to the College.

This Fellowship examination would have advantages. There would be a unity and an authority in its surgical thought, since it emanated from one body, and from a body which was competent to wield authority, namely, a college representing the surgical thought of Australia and New Zealand. It would be covered by one course of study. It would be taken in Australia and thus it would leave overseas travel to be wholly and more profitably occupied in the study of overseas surgical practice. It would provide for the surgical specialties an examination based on the principle held and often enunciated by the College, that is, that specialization in surgery should be imposed on a background of a sound knowledge of general surgery. This examination would, too, be of such a standard that it would pave the way to an ideal that we hope may not be very far distant, namely, that of a joint examination of the English and Australasian Colleges admitting to Fellowship of both, an ideal suggested by Lambert Rogers, who made the following statement in an address at the eighteenth annual general meeting of the Royal Australasian College of Surgeons:

> Not the least among the functions of this College, however, will be that of linkage with the elder sister in England. From time to time we in England have sent out examiners so that candidates in Australia might sit here for the first part of the examination for the Fellowship of the English College, a diploma which has now been established for over a century and, I think you will agree with me, is regarded as a "hall-mark" among qualifications in surgery. In the future, however, is it too much to hope that the traffic in examiners may not all be one way, but that we may have Australian examiners going to England to help conduct the examinations there? If the Courts of Examiners of our two Colleges would thus associate, the examination for the Fellowship of each could, I believe with mutual advantage, be made a uniform one. Post-war aerial travel may make this less difficult than it might now appear; and this closer association of our Colleges would not only do much to broaden surgical outlook, but also to strengthen the ties of Empire which link us, surgeons, together.

The main features of the College entrance examination as it now stands are as follows. It is an examination consisting of two parts—a primary and a final examination. The subjects for the primary examination are anatomy, including normal histology, physiology including applied physiology and the principles of pathology. Both subjects must be passed at the one examination. Applicants for admission to the final examination must be graduates of not less than five years' standing, must have undergone one year's training as a resident medical officer in an approved hospital, and must have completed a course of apprenticeship training, approved by the Censor-in-Chief, in general

surgery or in one of the special branches of surgery. Thus this surgical fellowship is so designed that: (*a*) it can be taken in surgery or in one of the surgical specialties—that is, in either gynæcology and operative obstetrics, urology, orthopædics, ophthalmology or otolaryngology; and (*b*) a candidate for Fellowship in any of these branches, although required to have a basic knowledge of general surgery, will be examined largely in his own subject.

To a Fellowship of this type, the highlights of which are its practical and its all-embracing character, there will attach a practical and therefore a useful significance. To the people it will be instinctive of competence in surgery or a surgical specialty. To the profession and to the hospital manager it will signify that he who possesses it is capable of giving to his patient the full benefits of surgery. There is no other degree or diploma which connotes those basic requirements in the application of surgery that are necessary qualifications in those who seek hospital appointments. But in such a diploma there is implicit this natural corollary: it is incumbent on those senior Fellows of the College, who hold responsible positions in hospitals, to educate hospital boards to realize that the candidate who leaves Australia or New Zealand for observation and study in overseas clinics, with all examinations behind him, with all his time and money expendable on travel and study, and with a mind equipped to absorb practical surgical knowledge by the practical training implicit to his Australasian diploma, has better equipped himself for a hospital job than the candidate who spends the greater part of his time overseas obtaining still another senior degree or diploma, and can therefore not afford properly to explore the avenues of post-graduate knowledge.

At first sight it may seem that this new form of Fellowship may involve some hardship. But it should not be any more formidable to the graduate, because the greater part of it is designed to be pertinent to his life's work, and the examination should come easily to him, since his textbook will be largely the hospital ward, the operating theatre and the post-mortem room.

H. B. DEVINE.

# Surgery in Other Countries.

*[In this column will be published short résumés of articles likely to be of practical value from Journals published in other countries and not readily accessible to surgeons in Australia and New Zealand.]*

## OCCLUSION OF THE AMPULLARY SEGMENT OF THE COMMON BILE DUCT.

**A. J. Bengolea and A. Negri:** "*La maladie du cholédoque terminal*", *Revue de chirurgie*, Volume lvi, 1947, page 65.

EVERY experienced surgeon knows of cases in which, after due investigation, a diagnosis of cholelithiasis has been made but in which careful and skilful operation fails to reveal stones. In the absence of evident extraductal causes for the obstruction, one is at a loss to know how to meet the situation. The explanation frequently put forward, of spasm of the sphincter of Oddi, is not accepted by the authors for the following reasons. The symptoms are of a permanent nature, and the dilatation of the common duct which exists is not compatible with so transitory a cause as muscular spasm. Spasm too is not demonstrable by cholangiography, and there is very frequently a quite decided rise of temperature in these cases. Antispasmodic drugs have no effect in relieving the condition. And finally there are demonstrable quite definite anatomical lesions in the duodenal section of the duct.

Of these lesions the most marked is hypertrophy and hyperplasia of the circular musculature, which is often sufficient to occlude the lumen entirely. This hypertrophy may be originated by local irritation, but may also be initiated by lesions in neighbouring organs, such as duodenitis or pancreatitis. It is always accompanied by glandular proliferations which may produce veritable adenomatous masses with excessive mucous secretion. In addition to these changes there occur significant degrees of inflammatory infiltration and sclerosis of the muscular and mucous layers. In nearly all the cases observed these changes were of chronic type, and most marked in the mucous layers. Later stages of the process include an increase of fibrous tissue and general induration. Finally must be mentioned the presence of tissue œdema in the distal part of the common duct, which, in one of these cases, was of so marked a character as to give rise to the supposition that serous inflammatory changes might well be the cause of the final aggravation of the obstruction.

The lesion is induced by pathological changes in the biliary system or in neighbouring organs. Cholelithiasis, even if it is limited to the gall-bladder, plays a preponderating part. An illustrative case report is that of a female patient who died following an operation for a strangulated hernia. Four days previously she had suffered from an acute attack of pain in the right hypochondrium, with a temperature of 39° C., followed by jaundice. At the autopsy the gall-bladder was found to be sclerosed and atrophied, and to contain a single large stone. The common duct was dilated and thick-walled, though it contained no stones. The pancreas and duodenum were normal. On histological investigation the terminal part of the common duct revealed the characteristic changes described above, the lumen being totally occluded by inflammatory infiltration of the duct mucosa. On the other hand, stones in the common duct, unless they are actually impacted, may coexist with an undilated duct with normal walls and an entirely unchanged sphincter mechanism. In fact the authors regard the role of stones, unless they are impacted, as being primarily important in originating intraductal changes, which may also be originated by duodenitis or pancreatitis in the absence of stones.

Clinically, therefore, one must expect to meet a class of patient whose symptoms indicate obstruction of the common duct, but in whom no stones are demonstrable as the immediate cause of the obstruction. These patients are always febrile, which is not surprising in view of the histological findings. It is in such cases as these that duodenal intubation brings relief, and in them drainage of the common duct even without direct relief of the obstruction will suffice to bring about cure. It is the rule for these cases to resolve and for the common duct to return to its normal size with a return of quite normal function. Cholangiography is of great assistance in forming a judgement as to the condition of the ducts, and should be used invariably in all cases in which the duct has to be opened.

ARTHUR E. BROWN.

## REPAIR OF INJURY TO THE AMPULLA OF VATER.

**P. Santy and E. Duroux:** *"La désinsertion de l'ampoule de Vater au cours de la gastro-duodénectomie pour ulcère: Traitement curatif"*, *Lyon chirurgical*, Volume xlii, 1947, page 13.

NUMEROUS technical methods have been devised to meet the distressing condition created when the ampulla of Vater, with its two vital ducts, is cut through during the process of separating a penetrating ulcer of the posterior duodenal wall from the underlying structures. The accident is fortunately rare, though not extremely so, as the following figures from various clinics demonstrate.

| Surgeon. | Gastro-duodenectomies. | Accident. |
|---|---|---|
| Paraskeras .. .. .. .. | 800 | 4 |
| Finsterer .. .. .. .. .. | 309 | 5 |
| Corachan .. .. .. .. .. | 383 | 4 |
| Santy .. .. .. .. .. .. | 300 | 3 |
| | 1,792 | 16 |

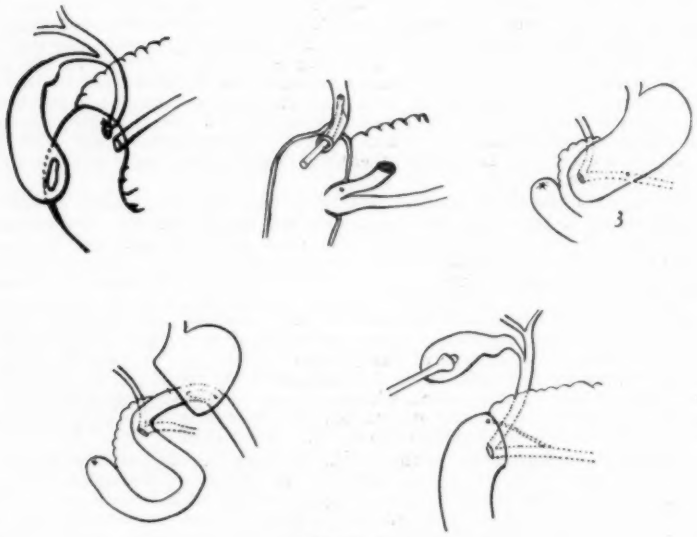


FIGURE I.

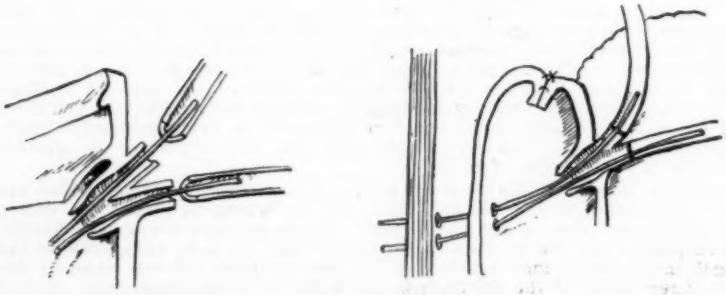

FIGURE II.

The various attempts to devise a satisfactory technique for reconstituting the patency of the biliary and pancreatic ducts are illustrated diagrammatically in Figures I and II.

In criticizing these varieties of technique, Santy and Duroux point out that the requirements for an ideal procedure are as follows: it must not throw an undue additional operative strain on the patient; it should not carry an undue risk of future fistula formation; it should not include the use of buried tubing; it should be applicable in those cases in which the ampulla itself is cut through, as well as in those in which a stump of the biliary and pancreatic ducts remains attached to the duodenum; and it must solve the problem of the severed pancreatic duct equally with that of the cut common duct. They recommend the following method, based on these requirements, as being free from the defects of most of the others. So soon as the injury to the ducts or ampulla is recognized, the duodenum is cut through just distal to the ulcer, as much duodenum as possible being left behind, and particularly enough of the anterior wall of it being left to form a sort of anterior flap. The cut end is then sutured onto the surface of the pancreas in such a manner that the two severed duct ends present into the duodenal lumen. Separate rows of interrupted sutures are inserted in the mucosal, muscular and serous coats of the bowel. The anterior surface of the pancreas holds the sutures well, both the serous covering and the underlying gland substance being thickened by the inflammatory reaction to the ulcer. An omental wrap round the anastomosis will give added security. Post-operative distension may occur either in the duodenum or in the ducts, and this should be guarded against, on the intestinal side by effective suspension of the afferent loop in making the anastomosis to the stomach, and on the biliary side by a temporary cholecystostomy. The importance of this last step was brought home to the authors when, in one case in which they had omitted it, they had to reopen the abdomen on the seventh post-operative day, on account of a tensely distended gall-bladder, filled with infected bile. They claim that this technique takes account of all the problems, both biliary and pancreatic, which are presented by such an emergency, and that it goes farther than any other method towards restoring normal conditions, whilst its simplicity adds very little to the severity of the major operation.

The immediate results have all been good, though for end-results insufficient time has so far elapsed to make a decision justifiable. Reports from patients at intervals up to five years after the operation have been reassuring. One patient still presents a minute biliary fistula. He was operated on in 1944 and opportunity was taken of his fistula to make a cholangiogram in 1945. At this time the termination of his common duct appeared to be much narrowed, although the bile flow through it did not appear to be obstructed. There was evident a certain degree of biliary stasis, the hepatic ramification being filled with lipiodol and the passage of bile out of it being effected after a certain amount of manual pressure. In 1946, however, this patient was still in excellent health. His case illustrates the definite possibility that at a late stage cholangitis may possibly supervene, more particularly so since the sphincter of Oddi no longer protects the biliary tree from intestinal reflux.

The authors consider that their operation should be regarded as the procedure of choice for any surgeon suddenly confronted with the condition described. It is rarely that any one surgeon will be so confronted, but it will add greatly to his comfort if he should be, to know that there is at his disposal a method so simple and reasonably effective.

ARTHUR E. BROWN.

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## TRANSPLANTING THE HUMAN PITUITARY IN SIMMONDS'S DISEASE.

**E. Kubanyi (Budapest):** *"Transplantation de l'hypophyse de cadavre dans le cas de maladie de Simmonds"*, *Lyon chirurgical*, Volume xlii, 1947, page 265.

OF all the ductless glands the pituitary is the one whose intimate association with the sympathetic nervous system is most marked. Therefore for a successful transplantation of this gland, regard should be had not only to an effective blood supply, but also to maintaining as far as is possible its nervous relations. The nerve supply of the pituitary gland reaches it from the superior cervical ganglion, by way of the carotid artery, and in the hope that a graft placed in close association with these fibres might receive some innervation from them, and its function in its new host might be thereby prolonged, Kubanyi conceived the idea of implanting it directly into the carotid sheath itself. The theory was tested in rats and, in the words of Kubanyi, "The results were surprising". The hypophysis was implanted into the neck muscles, and either the superior cervical ganglion itself or the cut end of its post-ganglionic branch was placed closely against it. After fourteen days the gland was excised and examined microscopically. The specific pituitary tissue had degenerated, but fibrils from the nerve stump were clearly seen travelling into it along the newly formed blood vessels.

The next stage was the implantation of a pituitary gland from a recently deceased person into the carotid sheath of a patient suffering from Simmonds's disease. The gland was removed in the operating theatre, with full aseptic technique, within two

hours of death by accident. This step was always carried out in the presence of an anatomo-pathologist or a "*médecin légiste*", who would later complete the autopsy for inquest purposes in the mortuary. Prior to removal of the pituitary, the thorax was always examined to exclude the possibility of tuberculous infection. Blood Wassermann tests were not done. The patient was brought to the theatre as soon as possible on receipt of news of the availability of a suitable cadaver. She was placed on a second table, screened from the first, and the surgeon prepared the graft bed while an assistant removed the pituitary. By this technique the gland can be implanted in the recipient within a minute or two of its removal from the donor.

This operation has been performed on four patients, of whom three had previously received grafts of calf pituitaries; the fourth had had no such previous treatment. Case reports are as follows.

1. A married woman, aged forty-one years, had onset of symptoms in 1926. Slow loss of weight occurred over fifteen years from 58 kilograms to 42 kilograms. Violent headaches, anorexia, asthenia and amenorrhœa occurred. The transplantation was performed in January, 1941, and healing was complete in eight days. Increase in weight and amelioration of the symptoms were apparent by the fifth post-operative week, and by the third month she had gained 8·5 kilograms, the menses had returned, the headaches vanished, the appetite was normal and her psychic state became entirely restored. In December, 1946, her weight was 56 kilograms and her health was perfect.

2. A girl, aged seventeen years, had onset of symptoms in 1937. In one year she lost 22 kilograms in weight (from 49 to 27 kilograms). In October, 1938, a calf's pituitary was implanted and in the following twelve months she gained 26 kilograms and had three menstrual periods. Then her condition went back. In February, 1941, she was so much worse that a second calf's pituitary was implanted, but no improvement followed this time. A third pituitary from a calf was implanted in March, but this was extruded. At this time her weight was 29·2 kilograms, her basal metabolism was −30% and her temperature was constantly below 36° C. A human pituitary was implanted by Kubanyi on June 18, 1941. On August 18 she had gained eight kilograms in weight and showed many clinical signs of improvement, including a ravenous appetite. In October she had gained 22 kilograms in weight, her basal metabolism was −1%. Her temperature was 36·8° C. In July, 1942, she was in full good health, but later died in a sanatorium of pulmonary tuberculosis.

3. A girl, aged nineteen years, had onset of symptoms in May, 1938, with a loss of 14 kilograms in weight in six months. A calf's pituitary produced no improvement and in 1940 she received an intravenous injection of 40 cubic centimetres of human serum taken from an acromegalic subject, again with no improvement. A human pituitary was implanted in January, 1941. Improvement was apparent in seven weeks and in three months she had gained 12·5 kilograms in weight. At an examination in November she was seen to have gained a further 13·5 kilograms and to be in every way well, but a few months later she died of bilateral pulmonary tuberculosis in a sanatorium.

4. A girl, aged nineteen years, had duration of symptoms for two years. Operation took place in August, 1941. She gained three kilograms in weight in twelve weeks, and her mentality altered strikingly for the better. A year after her operation she had gained 17 kilograms and was engaged in active farm labour "with zest". In 1946 she continued to be in full excellent health.

The conditions under which this operation is carried out are strict. The patients have been long studied and the diagnosis established by several doctors. The risks and possible gains from the operation are frankly discussed with either the patient or her parents, and on a decision to accept the operation being arrived at, she is sent home to await the suitable opportunity. The donor subjects are chosen with circumspection. A female cadaver is selected for a female patient, and if possible the cadaver is picked from the same age group as the patient. In Kubanyi's clinic approximately 15 to 20 persons every year die from accidental causes within two hours of their arrival in hospital, and when such a death of an appropriate female occurs the ambulance is immediately sent to the person on the register for whom the cadaver appears most suitable, and at the same time the other participants in the autopsy and the operation are brought together. The procedure has been used in seven cases, of which four were cases of Simmonds's disease, and the results have been "particularly happy".

ARTHUR E. BROWN.

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## VAGINAL OCCLUSION; LABHARDT'S OPERATION.

**J. Mathieu:** "*L'opération de Labhardt dans les prolapsus génitaux des femmes âgées*", *Lyon chirurgical*, Volume xlii, 1947, page 320.

LABHARDT has described his operation of occluding the vagina several times since 1923, but it appears still to be less well known than it merits. The principle is that of a

subtotal colpectomy, leaving of vaginal mucosa only the vault and a narrow passage of the calibre of a lead pencil occupying the anterior part of the original vaginal space.

Labhardt outlines five flaps. The first is nearly circular, surrounding the vulva except for one centimetre on either side of the meatus. Two other incisions run up on either side of the urethral line towards the vault; and from the top of these two others sweep back across the lateral vaginal walls, meeting about half-way down the posterior wall. All the mucosa included in these incisions is dissected away and removed. Mathieu modifies this particular technique, starting the operation in the manner of a perineorrhaphy and extending the dissection from behind forwards, but achieving the same end. The mucosal edges are infolded and sutured to form a narrow tube. The musculo-fascial structures are sutured together by several transverse rows of strong chromicized catgut forming a thick, solid perineum.

Labhardt's operation is not a dangerous one. Wenner, who carried his indications for operation to very great lengths, lost twelve patients in a series of 308. Mathieu has lost no patients in a series of 29. Wenner reported 26 failures in late results, the cause of failure being in the main the effects of faulty hæmostasis. Mathieu had one technical failure from the same cause; it occurred in a woman whose operation wound required packing some days afterwards on account of hæmorrhage. This woman, however, expresses herself as greatly relieved.

The procedure, of course, is only to be considered in women whose vaginæ are no longer functional. Its nearest rival is that of Lefort, which is based on the suture in stages from the bladder to the rectum. Labhardt's technique is based on the formation of a firm, tight perineum, and seems to carry all the anatomical advantages. The patients for whom it is absolutely indicated over Lefort's are those women who have previously undergone hysterectomy or in whom the operation of hysterectomy is indicated in combination with the support; those women who have an atresic vulva; those patients in whom the cystocele and the rectocele are disproportionate; and those patients who suffer from stress incontinence and in whom a procedure such as that of Marion is also needed.

ARTHUR E. BROWN.

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## OLLIER'S DISEASE.

**A. Cosacesco (Bucharest):** *"A propos de la dyschondroplasie d'Ollier"*, *Lyon chirurgical*, Volume xlii, 1947, page 311.

IN 1945 a boy of nine years sought medical assistance on account of a fractured left femur, the fracture having occurred with no trauma. On examination it was found that although the fragments were not overlapping the left thigh was considerably shorter than the right, and his mother gave the information that since he was four years old his limbs had grown unevenly and that small nodules had appeared on his fingers and toes, associated with vague limb pains and a developing limp. Clinically his left lower limb was found to be 4·5 centimetres shorter than the right, and the left upper limb 5·0 centimetres less than the right, the major part of the shortening in both limbs being in the proximal segment. In each case the shorter segment was larger in circumference than its opposite. There were characteristic enchondrotic nodules in the bones of the left foot and of both hands, but more especially the left. There were small similar nodules on the sixth ribs on each side. Radiographically clear cartilaginous patches were visible in practically all the long bones and in the pelvis, it being noticeable that these were very much more frequent on the left side of the body. A general examination did not reveal any other abnormalitis. Except for a slight degree of anæmia and a calcæmia of 1·30% the blood was unaltered.

This patient's condition quite evidently conforms to the type described in 1889 by Ollier under the name of dyschondroplasia. He laid great emphasis on the unilateral nature of the disease; but of 28 cases of this dyschondroplasia which were collected in 1936, only 17 were truly unilateral. The others showed, as does the one here reported, a marked preponderance for one or other side, but neither side of the body was free. Cosacesco's patient departed from the type in two respects. He was a boy, whereas most of the cases occur in girls; and he suffered a "spontaneous" fracture, which has been held to be rare.

The conditions known as chondrodystrophies, osteogenic exostoses, osteogenic enchondromata and Ollier's disease form a group whose exact relationship to each other is questionable. They are closely allied by characteristics common to all: the presence of cartilaginous masses outside its proper limits; the onset of growth abnormalities at a very early age; the arrest of growth in the affected bones and the similar distribution of the cartilaginous masses among the various bones.

Those who have sought to differentiate them into separate clinical entities, notably Roederer and Froyez, have enumerated differences which hardly seem to counterbalance the similarities. Sex, for instance, is not by any means an absolute differentiation—all types are occasionally found in both sexes. The date of onset is variable and the

distribution of the lesions, too, is sufficiently variable to make it a doubtful distinguishing mark. What was claimed to be a striking feature of Ollier's disease, its unilateral nature, has been shown already to be relative rather than absolute. The one remaining feature which does seem to make some mark of differentiation between Ollier's disease and the others is the supposedly inherited nature of exostoses and enchondromata. It is, however, not universally absent in Ollier's disease, and there have not so far been published enough cases of this disease to render a statistical opinion about it satisfying. One often finds, moreover, in published cases of Ollier's disease certain features which are more reminiscent of exostosis or enchondromatosis. In the patient here reported, for instance, there were thickening of the femur of exostotic type, enchondromata of the hands and feet, and at the same time the typical lesions of Ollier's disease in a boy with no family history of such a condition. In another case published by Boppe, Lievre and Franco, the Ollier's syndrome was associated with costal exostoses. Could one then say in these two cases that the exostoses were hereditary but the dyschondroplasia was not? Such associations argue in favour of a single basic factor causing all three conditions. They are one and the same in underlying pathology, an initial displacement of cartilage, undergoing an evolution in slightly different directions.

As for the underlying pathological basis, it remains unknown, in spite of various theories. Bentzon visualized the bony metaplasia as being due to vasomotor sympathetic influences. This conception conforms to the theories of Leriche, and must not be lightly dismissed. There is experimental evidence to the effect that by varying the circulatory influences one can produce cartilage apart from bone, and such influences could conceivably initiate some of the cartilaginous tumours. But when one has admitted that, the nature of these influences and of the influences behind them is still obscure. What is an undoubted fact is that the process is congenital in the true sense, in that it originates during fœtal life. Until we acquire more knowledge we must rest content with the belief that the basic origin of all these forms of cartilaginous dystrophies is one and the same. Beyond that we cannot go.

ARTHUR E. BROWN.

## Review.

**British Surgical Practice.** Volume I. By SIR ERNEST ROCK CARLING, F.R.C.S., F.R.C.P., and J. PATERSON ROSS, M.S., F.R.C.S.; 1947. London: Butterworth and Company, Limited. 9¼″ × 6½″, pp. 516, with 228 illustrations.

INSPECTION of the list of editors and their associates indicates the wide field of British practice covered in this work. Names of world fame in their subjects appear at the head of each chapter. Sir Hugh Devine and Professor Dew worthily contribute from Australia.

A most valuable departure in a surgical textbook is the inclusion of chapters on such important allied subjects as anxiety states, written by Sir Charles Symonds, anæsthesia by Archibald Marston, *angina pectoris* by Geoffrey Bourne, artificial pneumothorax by Peter Edwards. These are all most important additions by physicians to a surgical textbook.

The chapters on abscess by Professor Hadfield, on asepsis by Professor Garrod and on the anatomy of the autonomic nervous system by Professor Durward are likewise of unusual value in such a work. The purely surgical chapters are written with a considerable breadth of view and the various aspects of controversial subjects such as the delayed treatment of appendicitis are clearly discussed.

An excellent chapter on adrenal surgery is contributed by L. R. Broster.

Another extraordinarily good section is a series of short chapters on the various aspects of after-care.

A surgical reference system which interprets its subject with a philosophical breadth extending from anxiety states to after-care and omits nothing of standard and sound contemporary surgical thought and practice, is performing a function not hitherto attempted.

If Volume I, with its many beautiful illustrations, its bold paragraphing and many marginal headings, is a good sample of the work as a whole, we can look forward to a contribution to surgical literature worthy of its proud title. It is indeed a unique work and worthily expresses all that is best in the tradition and modern practice of British surgery. Not only will it be of great value to the non-specialist surgeon as a book of general guidance and reference, but it achieves also in its various sections a standard fit for the reference of specialists in the various branches of surgery.

# Proceedings of the Royal Australasian College of Surgeons.

## ANNUAL GENERAL MEETING.

THE twenty-first annual general meeting of the Royal Australasian College of Surgeons was held in Dunedin from January 27 to 31, 1948.

This was the first annual general meeting of the College to be held in Dunedin and it was particularly appropriate that it was presided over by Professor Gordon Bell.

Additional interest was added to the meeting because 1948 marked the centenary of the city of Dunedin, which attracted visitors from all over the Dominion. Sir Hugh Cairns, the first Sims Commonwealth Travelling Professor, took an active part in the meeting. Mr. Arthur Sims and his family, through whose generous benefaction the professorship was established, were also in Dunedin during the meeting.

The meeting was very well attended by the New Zealand Fellows—some ninety or more took part in the proceedings. The following office-bearers of the College attended: the senior Vice-President, Victor Hurley; the Censor-in-Chief, W. A. Hailes; and the Honorary Treasurer, Balcombe Quick. The Secretary of the College, Mr. Wheeler, was also present. Many Fellows from Australia would have attended had it not been for the extremely difficult transport problems.

The success of the meeting and the excellence of the arrangements were due to the work done by the President and the Honorary Secretary for New Zealand, Eardley Button, and on their shoulders fell much of the detailed work which is carried out at the headquarters of the College when meetings are held in Australia.

## INAUGURAL MEETING.

The inaugural meeting was held in the Concert Chamber of the Dunedin Town Hall on January 27, 1948. The meeting was opened by the Honourable Sir David Smith, Chancellor of the University of New Zealand.

### President's Address.

The President, Professor F. Gordon Bell, M.C., delivered his President's Address (see page 13).

### Death of Sir Lindo Ferguson.

The President made reference to the death of Sir Lindo Ferguson in the following terms:

> Before proceeding to the business of the evening I have a duty of piety to perform.
>
> The vital purpose of the Royal Australasian College of Surgeons is educational and this College would fail in its duty if, at this meeting, it did not record with profound regret the death of a great educationalist, Henry Lindo Ferguson.
>
> He was a founder of the College and its oldest Fellow, and I had hoped that he would adorn our twenty-first meeting with his distinction of person, his undiminished intellectual supremacy and the dignity of an exceptionally long life devoted to the highest interests of our calling; but that was not to be.
>
> It is the happy lot of few to come to a young country as a young man, to spend sixty-five years in it, to establish in the southern hemisphere a new specialty—that of ophthalmology—and at the same time to carve for himself a unique position in the hearts of his fellow citizens through enriching his chosen city by the depth and variety of his interests in its intellectual life.
>
> On the professional side, he introduced into this young university centre an Old World charm and dignity, a sincerity of purpose, a disregard for pecuniary considerations and a burning zeal for educational advancement, which in the course of half a century brought its own reward. He is in truth the architect of our Otago Medical School in its present form, and happily he lived to see most of his cherished purposes come true and to know that he occupied an enduring place in the affections of his colleagues and of his pupils.
>
> Such a record is only possible for one of highest calibre and I ask you to stand in tribute to the life of a remarkable man. We lament his death, but we rejoice in his triumphant life as a good citizen and as a devoted servant to the cause of medicine.

### The George Adlington Syme Oration.

The twelfth George Adlington Syme Oration was delivered by Sir Hugh Cairns, entitled "The Progress of Surgery, with Special Reference to Intracranial Surgery" (see page 3).

### Conferment of Honorary Fellowships.

In conferring honorary Fellowship on Sir Charles Hercus, D.S.O., O.B.E., M.D., the President made reference to his work in the following terms:

> Sir Charles Hercus: From the day when you left the shores of New Zealand with the main body of our first expeditionary force, bound to the Middle East, your career may be epitomized by a selfless devotion to duty: to your country, to the propagation of an enlightened conception of public health, and to the advancement of medical education in the widest sense. In the gullies and bays of Gallipoli and on the shifting sands of Palestine we may say that you laid the foundations of your fortunes and, sir, you built well.
>
> Your long apprenticeship as Sub-Dean of the Otago Medical School and your capacity for affairs eminently fitted you to guide the destinies of medical education in this Dominion through a difficult period; and your enthusiasm for the development of research has played a leading part in making Dunedin a promising contributor in the realm of medical investigation.
>
> In conferring its highest honour upon you, an administrator, a teacher, an investigator and a leader in public health, this College recognizes the essential unity of all branches of our calling and rejoices to welcome into its ranks a Fellow of our sister College of Physicians.

In conferring honorary Fellowship on Sir Hugh Cairns, K.B.E., M.A., D.M., F.R.C.S., the President referred to his work in the following terms:

> Sir Hugh Cairns: Your presence and mission here tonight as the first Commonwealth Professor give rise to many reflections. A short-lived, turbulent spirit taking his eternal rest in the Matoppos, on that hill which he called "The View of the World", would have rejoiced in this occasion and seen full justification for that child of his dreams, the Rhodes scholar. You are doubly welcome, first as a medical ambassador, linking Great Britain with Canada, South Africa, Australia and New Zealand, and second as a leader and teacher in your chosen field of neurological surgery.
>
> In our Commonwealth of Nations the mantle of your lamented chief, that great American Harvey Cushing, has descended upon you. In your turn you have become the high priest of the surgery of the brain and spinal cord, and your acolytes in Australia and New Zealand and in many other parts are, under your inspiration, already cultivating and enriching this difficult field in a way which must warm your heart.
>
> In conferring its honorary Fellowship upon you, a truant son of Australia, now bringing home for our benefit the fruits of your great experience and the laurels of your high distinction and of your devoted services to the Empire at war, this College of Surgeons of Australasia honours itself.

### Ceremony of Formal Admission of New Fellows.

The following New Zealand candidates were formally admitted to Fellowship of the College: Stephen De Carteret Barclay, Henry Campbell Barrett, Walter Irving Cawkwell, Hono Evan Horrell Denham, Frank Leo Hutter, George Richard Kingston, Ian Donald Gebbie, Charles Barclay Innes, Thomas Phillips Hardie Neil, Kenneth Rees-Thomas, Norman Waddle, Alan Wardale.

## COUNCIL MEETING.

### Admission of New Fellows.

The following Fellows were admitted by the Council at a meeting held on January 27, 1948:

*New South Wales*: Arthur Leary Carrodus, Frederick Nicholas Chenhall, Ross MacPherson Dunn, Edward William Gibson, John William McNamara, Stanley Devenish Meares, Noel Curtis Newton, Wallace James Pullen, Paul Angus Tomlinson.

*Queensland*: John Rudolph Sergius Lahz, John Aloysius Lynch, Edward Peter Row.

*Victoria*: Rex Vivian Blaubaum, Kiernan John Joseph Dorney, Ernest Edward Dunlop, Graham George Godfrey, William Robertson Gayton, Graeme Lindsay Grove, Ian Haig McConchie, Gordon Graham Calder McKenzie, Stanley Joseph O'Loughlin.

*Western Australia*: Albert Gild, Henry Manners Hill.

*New Zealand*: Stephen De Carteret Barclay, Henry Campbell Barrett, Walter Irving Cawkwell, Hono Evan Horrell Denham, Ian Donald Gebbie, Frank Leo Hutter, Charles Barclay Innes, George Richard Kingston, Thomas Phillips Hardie Neil, Kenneth Rees-Thomas, Norman Waddle, Alan Wardale.

The following matters arising out of the council meeting held on January 27, 1948, are published for the information of Fellows.

### Election of Council.

Eight nominations were received to fill six vacancies on the Council. As a result of the ballot 2,166 votes were cast by 361 Fellows, and the following six Fellows were reelected to the Council: George Bell, W. A. Hailes, Victor Hurley, Ivan B. Jose, Douglas Miller, Balcombe Quick.

### Appointment of State and Dominion Committees.

The following appointments were made:

*New Zealand*: P. Stanley Foster, G. W. Gower, J. A. Jenkins, B. C. Rennie, T. D. M. Stout, S. L. Wilson.

*New South Wales*: V. M. Coppleson, B. T. Edye, J. W. S. Laidley, R. A. Money, S. L. Spencer, K. W. Starr, N. R. Wyndham.

*Queensland*: A. E. Lee, A. V. Meehan, J. J. Power, A. D. D. Pye, N. G. Sutton, D. M. Yeates.

*South Australia*: R. M. Glynn, A. F. Hobbs, A. H. Lendon, L. C. E. Lindon, A. C. McEachern, B. H. Swift.

*Tasmania*: F. W. Fay, B. Hiller, D. W. L. Parker.

*Victoria*: Robert Officer, C. H. Osborn, C. A. M. Renou, John H. Shaw, Julian Smith, G. R. A. Syme, T. O. Sayle.

*Western Australia*: J. P. Ainslie, F. J. Clark, L. E. Le Souef.

## REPORT OF THE COUNCIL TO FELLOWS.

As the College financial year does not end until January 31, 1948, it is not possible during the period of the present meetings to hold the usual annual business meeting of Fellows. The annual business meeting will be convened on a date to be fixed later in the year. The Council desires, however, to submit the following report to this general meeting of Fellows. The report contains a record of the work of the College since the twentieth annual general meeting in June, 1947.

### Meetings of the Executive Committee.

The Executive Committee has met on fifteen occasions. The attendances were as follows:

| | |
|---|---|
| The Vice-President, Victor Hurley | 15 |
| The Censor-in-Chief, W. A. Hailes | 14 |
| The Honorary Treasurer, Balcombe Quick | 14 |
| Sir Hugh Devine | 14 |
| Henry Searby | 15 |
| Douglas Miller | 1 |

### Meetings of the Council.

Three meetings of the Council have been held since the last annual business meeting. The attendances were as follows:

| | |
|---|---|
| The President, Professor F. Gordon Bell | 2 |
| The Vice-President, Victor Hurley | 3 |
| The Vice-President, Professor H. R. Dew | — |
| The Censor-in-Chief, W. A. Hailes | 3 |
| The Honorary Treasurer, Balcombe Quick | 3 |
| Sir Hugh Devine | 2 |
| George Bell | 1 |
| J. Bruce Hamilton | 1 |
| I. B. Jose | 2 |
| Douglas Miller | 2 |
| H. R. G. Poate | — |
| Henry Searby | 2 |

### Fellows of the College.

The number of Fellows of the College at the date of this report is:

| | | |
|---|---|---|
| Honorary Fellows | | 14 |
| Overseas Fellows | | 13 |
| Australian Fellows— | | |
| New South Wales | 178 | |
| Queensland | 41 | |
| South Australia | 44 | |
| Tasmania | 13 | |
| Victoria | 201 | |
| Western Australia | 26 | |
| | | 503 |
| New Zealand Fellows | | 128 |
| Total | | 658 |

### Deaths of Fellows.

It is with the deepest regret that the Council reports the deaths of the following Fellows: Sir Lindo Ferguson (New Zealand); C. B. Howse, Sir Alexander MacCormick, H. A. Ridler, E. T. Thring (New South Wales); G. P. Dixon, Lilian V. Cooper, R. Thompson (Queensland); John Gray, Basil Kilvington, Julian Smith (Victoria); Theodore Ambrose (Western Australia). Letters of sympathy have been forwarded to their relatives.

### "The Australian and New Zealand Journal of Surgery."

THE AUSTRALIAN AND NEW ZEALAND JOURNAL OF SURGERY is now appearing more promptly, and recent numbers have been well up to date. It is, however, the desire of the Editorial Committee that the journal shall appear on the first day of each month of publication, and efforts are being made to ensure that this will be done.

### Gordon Craig Library.

The catalogue of the Gordon Craig Library, including a special section devoted to the Cowlishaw Collection, was published in October, 1947, and copies have been supplied to all Fellows of the College. Copies were also forwarded, with an explanatory letter, to Mrs. Craig, widow of the late Dr. R. Gordon Craig, and to Mrs. Cowlishaw, widow of the late Dr. Leslie Cowlishaw. The libraries throughout Australasia and overseas, with whom the library staff is in constant communication, received copies of the catalogue. Between the dates of publication of future catalogues it is proposed to announce new additions to the library in THE AUSTRALIAN AND NEW ZEALAND JOURNAL OF SURGERY.

The Council desires to place on record its gratitude to the following donors of books and material to the Gordon Craig Library: Sir Hugh Devine, Sir Alan Newton, Professor H. R. Dew, Victor Hurley, A. H. Joyce, Dr. C. V. Mackay, Dr. F. Kingsley Norris, Dr. E. Ringrose (through the Royal College of Surgeons of England), Professor Lambert Rogers, Dr. R. Scot Skirving, Dr. Henry Searby, Dr. John Zwar, Sir Alfred Webb-Johnson, the President and Council of the Royal College of Surgeons of England, British Medical Association (Tasmanian Branch), Medical Society of London, the Registrar of the University of Melbourne, Iowa State Medical Library, Roche Products Limited (England).

The following is a brief summary of the service rendered by the Gordon Craig Library for an average period of twelve months:

| | |
|---|---|
| Lists of bibliographies prepared | 320 |
| Books and periodicals supplied on loan | 1,735 |
| Reprints supplied on loan | 281 |
| Translations supplied | 12 |

It is stressed that Fellows of the College, Fellows and Members of the Royal Australasian College of Physicians, and members of the profession resident in Melbourne use the library for reading purposes, and a large quantity of the material dispatched from the library is for the benefit of Fellows resident in the various States of Australia and in New Zealand. The Executive Committee is encouraged by the demand received from Fellows not resident in Melbourne for library services.

### Gordon Craig Scholarships.

Applications for the fourth award of Gordon Craig scholarships close on January 31, 1948, and they will receive consideration by members of the Executive Committee during February, 1948.

### Louis Barnett Hydatid Registry.

The Louis Barnett Hydatid Registry has been transferred to New Zealand and the work of analysing the records has commenced. Mr. Norman Waddle has been appointed Principal Research Scholar, with Mr. D. G. Radcliffe, Mr. F. L. Hutter and Mr. Rowan Nicks as his assistants. It is hoped that the results revealed from the analysis of the records in the registry will be published in THE AUSTRALIAN AND NEW ZEALAND JOURNAL OF SURGERY.

### Post-Graduate Courses in Surgery.

The Council has continued to organize and conduct post-graduate courses in surgery at half-yearly intervals at Prince Henry's Hospital, Melbourne. To date these courses have been self-supporting.

In pursuance of the policy of the College in developing Prince Henry's Hospital, Melbourne, as its post-graduate school in surgery, post-graduate afternoons are also held at Prince Henry's Hospital on Friday in each week, from the first week in February until the last week in November in each year.

Members of the Council are encouraged by the satisfactory attendances at these sessions.

### Meetings of Interest to Those Practising Special Branches of Surgery.

Prior to the outbreak of war, evening meetings, open to all Fellows of the College, but of special interest to those practising special branches of surgery, were held at the College, and these are now being revived. The Council has asked the various State and Dominion Committees to arrange similar meetings in their States and in the Dominion of New Zealand.

### Primary Examination, Royal College of Surgeons of England.

The Council of the College has decided that negotiations be opened immediately with the Royal College of Surgeons of England for the conduct of an examination for the Primary Fellowship in Australasia at the earliest practicable date. It is hoped that the examination will be conducted in approximately twelve months' time.

### Twenty-Second Annual General Meeting.

With the growth of College activities and in an endeavour to provide adequate time efficiently to organize annual general meetings, members of the Council considered it essential to fix the venue and date of these meetings well in advance, and it has therefore been decided to hold the twenty-second annual general meeting in Brisbane in mid-winter of 1949. The organization of the meeting has already begun.

### Rupert Downes Memorial Fund.

Through Sir Alan Newton, the Trustees of the Rupert Downes Memorial Fund asked the Royal Australasian College of Surgeons to accept the fund and to administer it. The Council accepted the offer with pleasure. The fund was formed to perpetuate the memory of the late Major-General Rupert M. Downes, C.M.G., V.D., M.S., F.R.A.C.S., K.G.St.J., Director-General of Medical Services, 1935-1941, Inspector-General of Medical Services, 1941-1942, Director of Medical Services, 2nd Australian Army, 1942-1945, who died on service.

The income from the endowment, or such portion of it as the Council shall determine, shall be applied to the payment of a Rupert Downes Lecturer, who shall be appointed every third year by the Council. The subjects of the lecture shall be related to some aspect or aspects of military surgery, medical equipment (military and civil), the surgery of children, neurosurgery, general surgery, medical ethics or medical history, these being subjects in which Major-General Downes was particularly interested.

### Syme Scholar, 1948.

John Shaw, of Melbourne, has been appointed Syme Scholar for 1948. The subject of the scholarship is "The End-Results of the Treatment of Carcinoma of the Larynx".

### Michael and J. P. Ryan Scholarships in Surgery.

The examinations for the Michael and J. P. Ryan Scholarships in Surgery were held at the College during June, 1947. The results were as follows:

Michael Ryan Scholarship in Surgery: Shared equally, J. K. Clarebrough and J. L. Connell.

J. P. Ryan Scholarship in Surgery: Shared equally, T. H. Hurley and P. G. McMahon.

The Council desires to record its gratitude to Henry Searby and Leo Doyle, who conducted the examinations.

### Commonwealth Travelling Professor.

The College is privileged in having Sir Hugh Cairns with us on the occasion of this twenty-first annual general meeting, in which he is participating as the first Commonwealth Travelling Professor. In addition to his work in New Zealand, Sir Hugh Cairns will undertake work in Sydney, Melbourne, Adelaide and Brisbane under the terms of his appointment.

### Final Examination for Fellowship of the College.

In order to assist New Zealand graduates who desired to obtain the Fellowship of the College, and particularly ex-service medical officers, the Council has decided that Final Examinations for Fellowship of the College shall be held in New Zealand at least until December 31, 1951, when the matter can again be reviewed.

### Balance Sheets and Accounts.

As already mentioned earlier in this report, it is not possible to present the annual balance sheets and accounts at this meeting. These accounts will be presented at an annual general meeting of Fellows formally convened for the purpose. They will also be published in THE AUSTRALIAN AND NEW ZEALAND JOURNAL OF SURGERY.

### State and Dominion Meetings.

The following meetings, arranged by the various State and Dominion Committees, have been held:

New South Wales: Annual meeting, Sydney, October 8, 1947.

New Zealand: Annual meeting, Christchurch, May 29 and 30, 1947.

Queensland: Annual meeting, Brisbane, June 17, 1947.

South Australia: Annual meeting, Adelaide, August 13, 1947; clinical meeting, Adelaide, November 19, 1947.

Tasmania: Annual meeting, Hobart, October 31 and November 1, 1947.

Victoria: Evening meeting, Melbourne, June 26, 1947; half-day meeting, Melbourne, December 5, 1947.

## Books Received.

"The 1947 Year Book in Orthopedics and Traumatic Surgery." Edited by Edward L. Compere, M.D.; 1948. Chicago: Year Book Publishers, Incorporated. 7″ × 4¼″, pp. 438, with 254 illustrations. Price: $3.75.

"Good Health with Diabetes." By Ian Murray, M.D., F.R.F.P.S.G., F.R.C.P.E., and Margaret B. Muir, S.R.N. Edinburgh: E. and S. Livingstone, Limited. 7″ × 4¾″, pp. 48. Price: 2s. (Sterling).

"Textbook of Surgical Treatment, including Operative Surgery." By C. F. W. Illingworth, C.B.E., M.D., Ch.M., F.R.C.S.E.; Third Edition; 1947. Edinburgh: E. and S. Livingstone, Limited. 9½″ × 5½″, pp. 656. Price: 32s. 6d. net (Sterling).

"Illustrations of Regional Anatomy." By E. B. Jamieson, M.D.; in seven sections; Seventh Edition; 1947. Edinburgh: E. and S. Livingstone, Limited. 8″ × 6″. Section I, 51 plates; Price: 12s. (Sterling). Section II, 64 plates; Price: 15s. (Sterling). Section III, 44 plates; Price: 10s. net (Sterling). Section IV, 35 plates; Price: 8s. 6d. net (Sterling). Section V, 32 plates; Price: 7s. 6d. net (Sterling). Section VI, 42 plates; Price: 10s. net (Sterling). Section VII, 52 plates; Price: 12s. net (Sterling). Also published in one volume. Price 75s. net (Sterling).

"*Confrontations radio-anatomo-cliniques.*" By M. Chiray, R. A. Guttmann and J. Seneque; Second Edition; 1947. Paris: Masson et Cie. 12½″ × 10″, pp. 70, with 140 figures. Price: Fr. 465.

"*Les embolies de l'artère pulmonaire et des artères des membres.*" By R. Leriche; 1947. Paris: Masson et Cie. 8½″ × 6½″, pp. 128, with 5 figures. Price: Fr. 150.

"*Anais da clinica ginecologica da faculdade de medicina da universidade de S. Paulo.*" By Avenida Dr. Arnaldo; 1947. Brazil: Faculdade de medicina da Universidade de S. Paulo. 9¼″ × 6″, pp. 203, with 16 figures.